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JUNE 1960

Volume 55 Number 6

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IN THIS ISSUE

A PRACTICAL HERD REPRODUCTIVE PROGRAM
A NEW SURGICAL TECHNIC FOR EYELID TUMORS
PROCEDURE FOR CONTINUOUS EPIDURAL ANESTHESIA
MECHANIZED PRACTICE BOOKKEEPING
LABORATORY DIAGNOSTIC AID FOR PYOMETRA

Complete Index on Page 7

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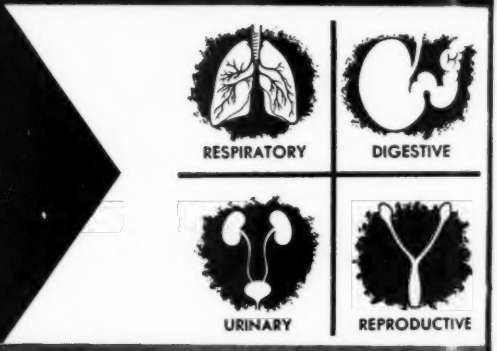

INDICATIONS:

- urethral calculi and bladder sphincter spasms.
- obstetrical complications as in pre and post parturient straining or prolapsing and in cervical spasm.
- vomition control as in nephritis or poisoning.
- anal prolapse.
- coughing spasms as in kennel cough.

- spasms of ureter, bladder sphincter and urethra.

- tenesmus in enteritis.
- subacute and chronic scours to "normalize" hyper-motility of intestinal tract.
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- choke spasms.

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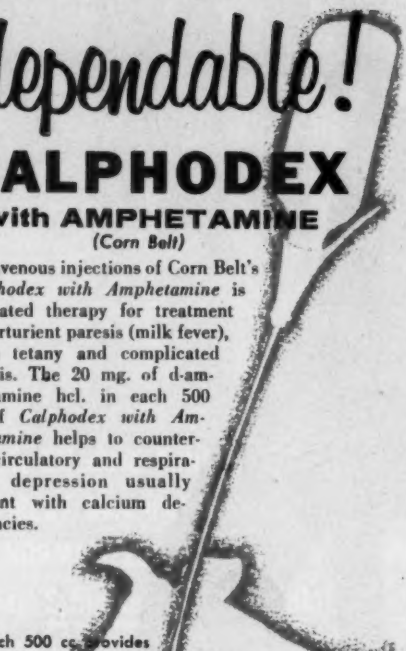

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JUN

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Squibb Triamcinolone Acetonide, Thiostrepton, Neomycin and Nystatin in Plastibase

Panolog Ointment is indicated both in the treatment of many dermatologic as well as non-dermatologic conditions, including acute and chronic otitis of varied etiologies, interdigital cysts, and recurrent anal gland infections.

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NEWS COMMENT

New Seal On Pet Foods

A new U.S.D.A. seal is now in use on pet foods. A change in regulations governing inspection of animal foods permits use of the new official seal on pet foods passed for inspection. Tell your clients that two types of pet food are government inspected. One is termed a normal maintenance pet food said to be suitable for year around use without supplementation. The other type is an animal protein supplement intended for supplementation.

Corneal Transplants

Corneal transplants have been made from the eyes of cats to the eyes of two volunteer human patients whose corneas were being destroyed by disease. In these cases the cat corneas saved eyesight and became indistinguishable from the normal human tissue. Along with these investigations dehydration of human corneas is providing indefinite storage. Suitable for partial thickness grafts, the dried grafts can be shipped anywhere in vacuum sealed tubes at room temperature. They can be rehydrated and ready for drafting in about 15 minutes.

Drugs On Consignment

Pre-planned veterinary service has become top feature news in the nation's leading farm magazines. The most recent report in Farm Journal cites that Battlecreek, Michigan veterinarians, Dr. Jackson and Dr. Roberts, have added a new wrinkle to their regular pregnancy examination, sterility work, and mastitis prevention service. They leave a supply of drugs with the dairyman which he is apt to use and need. Each month they bill the client for what he has actually used.

Cheese Filters For Cigarettes

Wisconsin has a new cheese promotion idea that even tops their long established law that pie served in a restaurant must legally be accompanied by Wisconsin cheese. A University of Wisconsin scientist has mixed two-thirds cheese and one-third charcoal and produced a cigarette filter that trapped 90% of the tars. One new brand would probably be Cheddarfields.

Milk Fat Studies

The amount of fat in milk can be altered either chemically or by physically altered feeding rations. These treatments are believed to change the proportion of volatile fatty acids produced in the rumen. Indications are that volatile fatty acids are involved in waste heat when metabolized in the body.

Brucellosis In Heart Disease

Brucellosis may contribute to some cases of heart disease formerly attributed to rheumatic fever according to University of California and Long Beach VA Hospital investigators. Heart damage in guinea pigs with brucellosis is their principal research technic.

Human Viruses and Shipping Fever

Viruses similar to mumps and human influenza are reported to be harbored by cattle with shipping fever in studies by U. of Maryland, U.S. Public Health and National Institute of Health studies. The virus isolated is identified myxovirus parainfluenza 3.

Cadaver Blood

Six to 8 pints of blood may be obtained from human cadavers within 10 hours of death due to accidental or noninfectious causes. Four-fifths of all blood given at a Moscow institute is obtained through this source. Blood from this source does not clot and does not require chemical additives. According to Russian workers it is usable for five weeks if properly refrigerated. This procedure arouses little interest in this country's medical circles but has suggested possible exploration of more extensive use of packing house blood sources by veterinary clinicians.

Pine Needle Toxicity

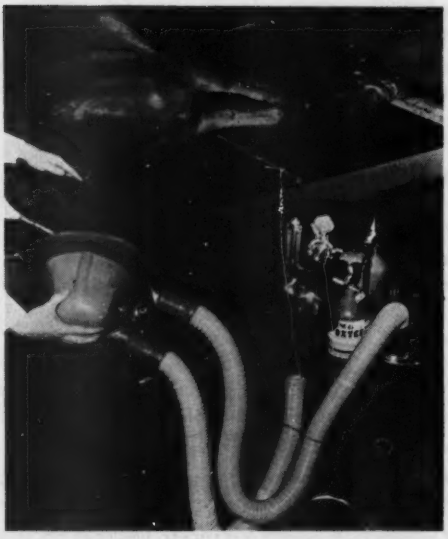
Pine tree needles have been incriminated as a possible cause of bovine abortion by Colorado State University investigators. Cattle will eat pine needles greedily even when getting plenty of hay and water.

Here each month are published ideas, suggestions and comments by VM reporters.

The Meeting Circuit

Large Animal Gas Anesthesia

New techniques for anesthetizing animals for surgery are being made possible with the use of flexible tubing. The new method eliminates tying struggling animals and prepares them for surgery quickly and efficiently. The machine is the first closed-circuit anesthesia gas unit in the United States. It can keep large animals asleep for any length of time and can serve as a resuscitator. The device consists of a rebreathing bag as a reservoir, gas and oxygen supply, control system, carbon dioxide absorber, inhaling mask, and flexible tubing connectors. A high quality polyvinyl chloride plastic flexible tubing called "Vac-U-Flex" was recommended for the machine by Flexible Tubing Corporation, Guilford, Conn., because the tubing is leakproof, heat resistant, and impervious to the gases used. The crush-resistant tubing bends easily, even around sharp corners, and always maintains its full cross section. The tubing's smooth bore assures minimum resistance to gas flow . . . a vital factor with large animal anesthesia where a large volume of gas is required. Flexible tubing is reinforced with plastic-coated spring steel wire which prevents crushing and corrosion; the tubing is easily cleaned with detergents. The new machine to anesthetize large animals is manufactured by National Cylinder Gas Division of Chemetron Corporation in Chicago.



Passing a Stomach Tube

If you need to pass the stomach tube on a horse that will strike, use a heavy rope halter with a 15-20 ft. lead. Snub his head tight against a telephone pole or something similar. Use only one hitch around the post and have an assistant stand back and hold the rope. With the head tight against the post, the horse cannot reach you with his feet. He will usually resist once violently and then stand still while you pass the tube.—*Veterinary Scope, Fall 1959.*

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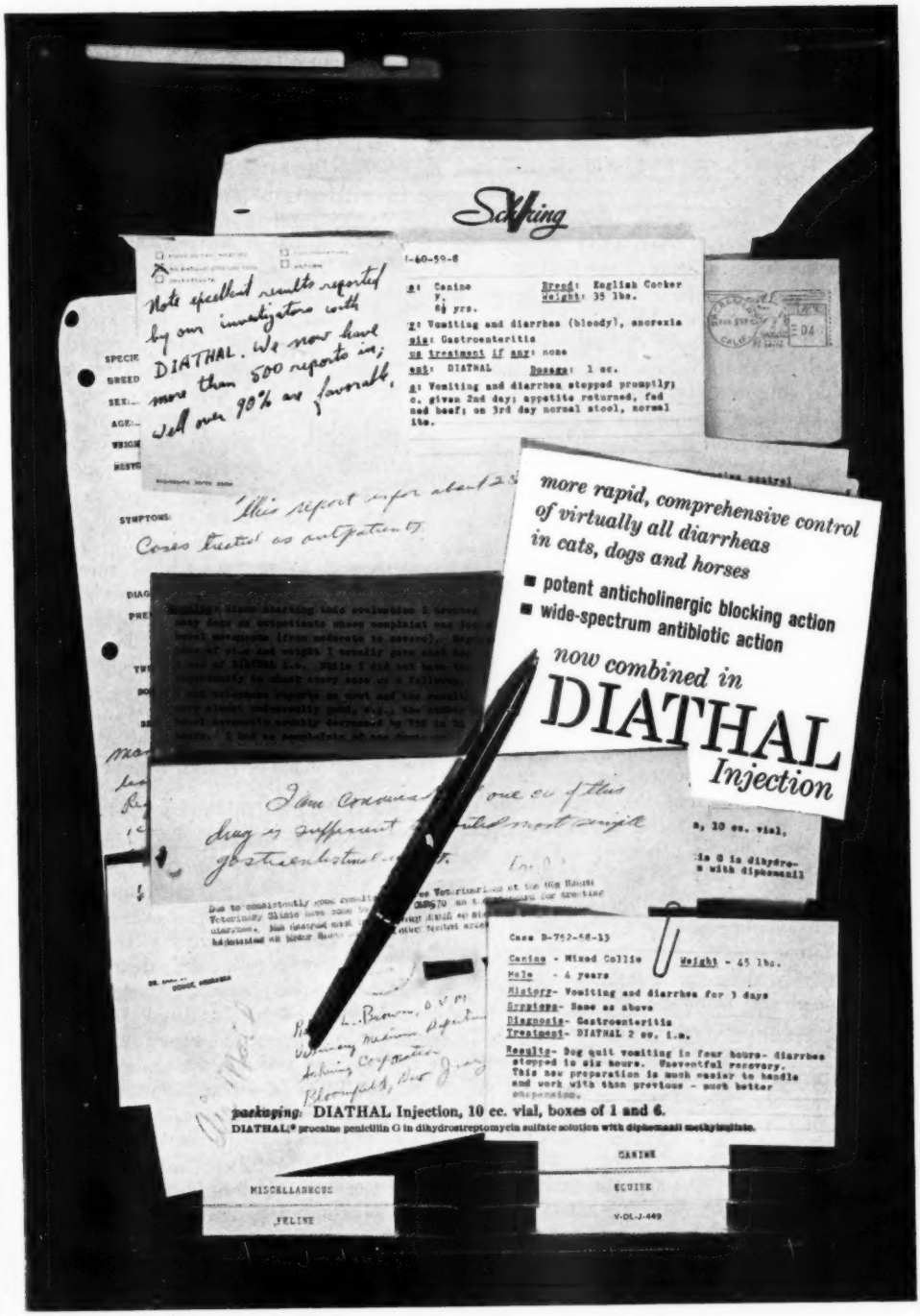
REFERENCES: 1. Michaelson, S. M., and Covert, M.: J. Am. Vet. M. Ass. 134:334 (Apr.) 1959. 2. Mosier, J. E., and Coles, E. H.: Vet. Med. 53:619 (Dec.) 1958. 3. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 4. Coles, E. H., and Mosier, J. E.: Am. J. Vet. Res. 20:1020 (Nov.) 1959. 5. Mosier, J. E.: Vet. Med. 52:445 (Sept.) 1957.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Organic Phosphorus Compounds

Among the most promising new pesticides for poultry are the organic phosphorus compounds, most of which are still under study for positive results against insects, harmful side effects, and residues they may leave.

Malathion, an organic phosphorus compound, is effective when used against lice and some mites, as well as the fowl tick and the ordinary flea. New compounds such as Dipterex, Dicapthon, Chlorothion, Diazinon, Dow ET-57 and Bayer 21/199 have proved out well in preliminary tests. Lindane is still proving out well in poultry houses. DDT has been abandoned because of undesirable residual chemicals in the meat.

Farm Pond Losses

This past winter too many cattlemen lost cattle that drowned when they broke through the ice on deep farm ponds. Deep snow cover and continuous heavy storms kept the ice from freezing deeply enough to hold the weight of several heavy cattle.

Farm ponds, properly constructed, fenced and equipped with pipe running into a stock tank, are most practical, as the impounded water is a welcome reserve in hot, dry weather. The fact that the supply is automatically regulated by a float valve and that no pumping is necessary adds to the pond's value.

Unfenced ponds can be the cause of cattle losses in summer as well as in winter. In hot summer weather cattle wade into these ponds belly deep to drink and cool off. Droppings and urine from diseased or infected cattle in pond water are always potential methods of spreading disease. Leptospirosis is only one of the infections which can be spread by cattle drinking contaminated pond water.

Returns from ponds together with added safety, sanitation and disease control are greatly increased by finishing the construction job and fencing these watering ponds and piping the clean drinking water to a stock tank. Tell your clients the efficiency of a good but unfenced stock pond is comparable to a well-planned house without doors.

Mixed Semen

Veterinary, Animal Husbandry, and genetic literature has in recent periods reported on a type of artificial insemination practiced in sheep, bovines, rabbits, etc. in which a mixed semen is used. Semen from at least two males of the same species is used, heterospermic insemination in contrast to homospermic or one-male insemination. Broadly generalized, the claim has been made that mixed semens in the case of sheep resulted in increased vigor, weight, and a higher conception rate. Geneticists have refuted such claims on the grounds that insemination would still result in fertilization of the ova by the sperm of only one of the males in unipara, or in multipara each ovum would have union with only one sperm so that in this case the male parentage could or probably would be mixed. Controlled research by breeders in the United States, England and Australia bears out the opinion of geneticists—which is that mixed semen does not result in a higher conception rate, nor more vigor or higher weight at birth.

Muscular Distrophy

Maplesden, Harvey & Branion, as reported in *The Canadian Veterinary Jour.* Vol. I, No. I, Jan. '60, produced nutritional muscular dystrophy experimentally in male calves by feeding a basal diet of 70% skimmed milk, 5% dextrose, and 20% "stripped" lard. The addition of brewer's yeast to the basal diet, or increasing phosphorus content of the basal diet did not prevent the disease, though the addition of alpha-tocopherol to the basal diet prevented the ailment in calves.

Cesarean Section

If Cesarean Section is performed early on the cow, before manipulation or bruising causes shock, you can handle some extremely putrid cases and the cow will still get up and go.

Mastitis In Sweden

In a report from the 1958 Collected Papers of the Swedish State Veterinary Medical Institute, Funke, Hillermark, and Moress report observations on mastitis. They found *Staph. aureus* the principal cause in herds observed by them, and their observations led them to suspect important predisposing factors in the spread and development of mastitis are (1) stepping on teats; (2) drying and fissuring of the teats by clay adhering to them; and (3) penetrating wounds from spiny vegetation.

Barbiturates in Swine

Literature from Czechoslovakia contains information that they are producing a very satisfactory general anesthesia in swine with one of the barbiturates, sodium ethyl methyl-butyl thiobarbiturate, called thiopental. It is applied intravenously into the posterior auricular vein. The dose of thiopental is 15-20 mg/kg. It results in quick anesthesia lasting 20 to 35 minutes. An important point mentioned is that one-half the dose is administered quickly and the remainder slowly depending upon the frequency and quality of the respiration. It is stated that recovery from this form of general anesthesia is quiet with no unfavorable secondary effects.

New Pregnancy Diagnostic Method

The usual practitioner's methods of determining bovine pregnancy i.e. by palpation, and by non-recurrence of estrus following insemination for two or three consecutive periods have recently been augmented by still another technic reported from the University of Maryland. An inflated balloon is inserted into the vagina, which is connected to a manometer and rubber bulb by means of plastic tubing. Thirty U.S.P. units of oxytocin are administered intravenously. If the animal is pregnant an increased pressure of ten mm. of mercury results; cows in estrus also respond, though during anestrus, proestrus and in the non-pregnant animal the response is very mild. At the present stage of research on this project the procedure was found to be 90% accurate.

Actinobacillosis Treatment

Dihydrostreptomycin seems to be the choice of some practitioners in handling multiple, inoperable actinobacillosis of cattle. The agent is administered intramuscularly twice daily in doses of about five grams for a period of five days in animals weighing 750 to 1,000 pounds. In the larger single *mandibular* abscesses radical surgery with the removal, intact, of the contents and the reactionary tissue—under anesthesia is still the favorite of many. Occasionally the old time method of handling—usually because of proximity to important anatomical structures—is simply establishing drainage, and for a period of 24 hours immediately following the foregoing step, tamponading with gauze saturated with Lugol's solution of iodine.

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A HERD PROGRAM FOR REPRODUCTIVE IMPROVEMENT

JOHN B. HERRICK, D.V.M.
Extension Veterinarian
Iowa State University
Ames, Iowa

Herd health programs involving prearranged fees for the attending veterinarian have created considerable interest in the press. In the field it has been found that in many cases neither the veterinarian nor many clients have a tremendous interest in the program and as yet are not actively participating on a very broad scale. One phase of herd health in cattle is the maintenance of reproductive efficiency, a phase that requires periodic herd examinations in order for the cattleman to realize increased profit from the veterinarian's service.

Pregnancy Determination in the Cow

It is impossible to do a satisfactory job of determining problems of reproduction without being able to diagnose pregnancy in heifers at 30 days and mature cows at 60 days. In determining whether or not a cow is pregnant, the technic yielding the best results is the manual method. This method involves picking up the entire uterus in the gloved hand with the middle finger placed at the bifurcation of the horns. The horn is then allowed to slide between the thumb and first two fingers, palpating for the amnionic vesicle which will be turgid. The vesicle will slip away from the thumb and forefinger, giving the so-called "slippery action."

The amnionic vesicle will usually be found on the same side as the ovary possessing a corpus luteum. The embryo is enclosed in the fluid-filled amniotic vesicle which in turn is encased in the fluid filled chorionic vesicles. The inner vesicle is extremely turgid up to 6 to 7 weeks of pregnancy; after that time it loses its turgidity.

The following charts will serve as a guide for the veterinarian setting up a program to improve reproductive efficiency on a herd basis.

Chart I Pregnancy Determination in the Cow

Days of Gestation	Shape of Amniotic Vesicle	Lengths Crown to Rump	Fluid Volume	Size of Uterine Artery
30-35	Round and firm slippery feel	3/8" 7/16" "size of pea"	60-75 cc	—
50	Oblong and soft	2" "size of butter nut"	200 cc Fetal Membrane	—
90-100	Fetus	4" 7" "small rat"	1 quart cotyledons evident	—
5 months 150 days	Fetus difficult to palpate	12" 16" "large cat"	7 quarts	3/16" dia.
6 months 180 days	Fetus	20" 24" "small dog"	7-8 quarts	(pencil)
7-8 months	Palpate Appendages	2'-3'	7-8 quarts	7/16"-1/2" Strong pulsation

INFERTILITY IN THE INDIVIDUAL COW
Chart II History, Findings, Diagnosis and Suggested Treatment

Cattleman's Observation and History	Examination Per Rectum	Diagnosis	Treatment Suggestions
Regular heats but animal fails to settle	(a) No pathology revealed by palpation or abnormal discharge observed through speculum, when posterior os of cervix is viewed through speculum.	This condition extremely difficult to diagnose. Sub-clinical uterine infections common. Hormone imbalance also possible resulting in late ovulation. Progesterone insufficiency.	Intra-uterine infusion; next heat period do not breed. Following heat period sensitize the tract three days prior to anticipated heat with estrogens; follow in 24 hours with F.S.H. Breed—
	(b) Adhesions of bursa to ovaries bilateral — unilateral —	If cannot be broken down recommend selling animal. Same as above.	If C.L. is small, use progesterone at time of heat (200 mg.)
	(c) Salpingitis —	Usually accompanied by other pathology that will decide disposition of the animal.	
Irregular heats (shorter or longer than 21-22 days)			
(a) Chronic Buller	(a) Cysts in ovary of follicular type, may be several, size of grape, to one single varying from marble to orange size, unilateral or bilateral.	Follicular cyst, usually due to luteinizing insufficiency.	Rupture of cyst per rectum or if thick walled, drain by needle vaginally. Luteinizing hormone IV (1500 units)
(b) Short cycles, no evidence of nymphomania.	(b) Ovaries normal, no cysts, very small C. L. on 8th day of cycle.	Progesterone insufficiency. Short cycle	200 mg. of progesterone 1st to 5th day of cycle
(c) Long cycles 24-29 days or longer	(c) Ovaries normal, tract normal — pregnant other horn?	Pregnant.	Recall to always check for pregnancy because many pregnant cows come in heat.
	(d) Active C. L. (no pathology, animal not pregnant)	Missed heat observations	Check closely for heats
	(e) Firmly organized C. L. No other pathology.	Failure of ovulation of C.L.	Sensitize the tract with estrogens, followed in 24 hours with F.S.H.
	(f) Tract normal, C. L. small	In heifers—infantilism . . . In mature cows—delayed ovulation, hormone imbalance	1500 units F.S.H. 3 days prior to heat, repeat if necessary . . . Estrogens followed by F.S.H. thyroprotein one pound administered over one week's time —in some cases progesterone following next heat period.
	(g) Tract spongy, no tone	Endometritis	Intra-uterine infusion, skip heat period — breed next cycle.

INFERTILITY IN THE INDIVIDUAL COW
Chart II History, Findings, Diagnosis and Suggested Treatment

Cattleman's Observation and History	Examination Per Rectum	Diagnosis	Treatment Suggestions
No heat	(a) Pregnancy	Pregnancy	Recall to always check all tracts for pregnancy—regardless of history.
	(b) Thick spongy uterine horn—pits on pressure—exudate evident from posterior os of cervix	Metritis	Inoculate C.L. if positive—estrogens plus intrauterine infusion of medicant in oil or propylene glycol base—allow two normal heat periods before breeding.
	(c) No significant structure on either ovary	Anestrous—hormone inbalance. Phosphorus deficiency if more than one cow in the herd	Sensitize tract with estrogens followed by 1500 units F.S.H. in 24 hours.
	(d) Tract OK. Large C. L. fibrous cover	Retained C.L.? Most C.L.'s palpated are not retained but are result of quiet heats—may be hormone unbalance	Express C.L. if practicable without resulting ovarian damage. If unsuccessful, not cyclic, normally follow with F.S.H. Therapy.
	Large C. L. that pits on pressure or large cyst with luteal tissue base	Cystic corpus luteum. Malfunctioning of pituitary gland?	Rupture cyst if possible; if not drain by vaginal approach. Estrogens.
	Tract normal	Suspected quiet heat or missed heat	Recheck C.L. condition and watch for heat. If re-examination reveals C.L. obvious heat was missed.
Animal bred returns to heat in 35-45 days or longer.	(a) Tract normal, small C. L.	C.L. insufficiency	300 mg. of progesterone time of breeding. Repeat every 3 weeks.
	(b) One horn tube—slightly enlarged.	Abortion?	Allow two heat periods to elapse before re-breeding—attempt to determine if a heat problem.

INFERTILITY IN THE INDIVIDUAL COW

Chart II History, Findings, Diagnosis and Suggested Treatment

Cattleman's Observation and History	Examination Per Rectum	Diagnosis	Treatment Suggestions
Regular heats but animal fails to settle	(a No pathology revealed by palpation or abnormal discharge observed through speculum, when posterior os of cervix is viewed through speculum.	This condition extremely difficult to diagnose. Subclinical uterine infections common. Hormone imbalance also possible resulting in late ovulation. Progesterone insufficiency.	Intra-uterine infusion; next heat period do not breed. Following heat period sensitize the tract three days prior to anticipated heat with estrogens; follow in 24 hours with F.S.H. Breed—
	(b) Adhesions of bursa to ovaries bilateral — unilateral —	If cannot be broken down recommend selling animal. Same as above.	If C.L. is small, use progesterone at time of heat (200 mg.)
	(c) Salpingitis —	Usually accompanied by other pathology that will decide disposition of the animal.	
Irregular heats (shorter or longer than 21-22 days)			
(a) Chronic Buller	(a) Cysts on ovary of follicular type, may be several, size of grape, to one single varying from marble to orange size, unilateral or bilateral.	Follicular cyst possibly due to luteinizing insufficiency.	Rupture of cyst per rectum or if thick walled, drain by needle vaginally. Luteinizing hormone IV (1500 units)
(b) Short cycles, no evidence of nymphomania.	(b) Ovaries normal, no cysts, very small C. L. on 8th day of cycle.	Progesterone insufficiency. Short cycle	200 mg. of progesterone 1st to 5th day of cycle
(c) Long cycles 24-29 days or longer	(c) Ovaries normal, tract normal — pregnant either horns?	Pregnant	Recall to always check for pregnancy because many pregnant cows come in heat
	(d) Active C. L. (no pathology, animal not pregnant)	Missed heat observations	Check closely for heats
	(e) Firmly organized C. L. No other pathology.	Failure of recession of C.L.	Sensitize the tract with estrogens, followed in 24 hours with F.S.H.
	(f) Tract normal, C. L. small	In heifers—infantilism . . . In mature cows—delayed ovulation, hormone imbalance	1500 units F.S.H. 3 days prior to heat, repeat if necessary . . . Estrogens followed by F.S.H. thyroprotein one pound administered over one week's time —in some cases progesterone following next heat period.
	(g) Tract spongy, no tone	Endometritis	Intra-uterine infusion, skip heat period — breed next cycle

INFERTILITY IN THE INDIVIDUAL COW
Chart II History, Findings, Diagnosis and Suggested Treatment

Cattleman's Observation and History	Examination Per Rectum	Diagnosis	Treatment Suggestions
No heat	(a) Pregnancy	Pregnancy	Recall to always check all tracts for pregnancy—regardless of history.
	(b) Thick spongy uterine horn—pits on pressure—exudate evident from posterior os of cervix	Metritis	Enucleate C.L. if possible—estrogens plus intrauterine infusion of medicant in oil or propylene glycol base—allow two normal heat periods before breeding.
	(c) No significant structure on either ovary	Anestrous—hormone inbalance. Phosphorus deficiency if more than one cow in the herd	Sensitize tract with estrogens followed by 1500 units F.S.H. in 24 hours.
	(d) Tracts OK., large C. L., fibrous cover	Retained C.L.? Most C.L.'s palpated are not retained but are result of *quiet* heats—may be hormone unbalance	Express C.L. If it enucleates without resulting ovarian damage. If animal does not cycle normally, follow with F.S.H. Therapy.
	Large C. L. that pits on pressure or large cyst with luteal tissue base	Cystic corpus luteum. Malfunctioning of pituitary gland?	Rupture cyst if possible; if not drain by vaginal approach. Estrogens.
	Tract normal	Suspected quiet heat or missed heat	Retain C.L. Record observation and watch for heat. If re-examination reveals C.L. obvious heat was missed.
Animal bred returns to heat in 35-45 days or longer.	(a) Tract normal, small C. L.	C.L. insufficiency	300 mg. of progesterone time of breeding. Repeat every 3 weeks.
	(b) One horn lacks tone—slightly enlarged.	Abortion?	Allow two heat periods to elapse before re-breeding—attempt to determine if a herd problem.

SCOURING IN DAIRY CALVES

Iain Paton, M.R.C.V.S.
Director of Professional
Services, Jensen Salsbery Labs.

In considering scouring in calves as a symptom rather than a disease in itself, our perspective is immensely improved. A consideration of age, general methods of husbandry, climate, and nutrition are as important as specific bacterial, viral. or other infectious agents. Therefore, antibiotic or other antimicrobial therapy is not logically the ultimate answer.

Nutrition

The influence of nutrition on calf scours can obviously occur through imbalance and gross deficiencies in the diet. The effect of the diet of the dam is, however, less well documented. The well-known laxative effect of colostrum is an extreme example of the action of ingested milk. During wartime farming operations in Great Britain, dairy rations were scarce and the demand for protein exceeded the supply. Imported linseed and other oil cakes and meals were replaced in many instances by home-grown ground bean and ground pea meal as integral parts of a high protein dairy ration. In some instances this was accompanied by a significant increase in the morbidity and mortality from a scour syndrome in bucket-fed calves.

From purely circumstantial evidence, it was concluded that a dietary factor was

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Presented At The Alabama State Meeting, April, 1960.

being transferred via the milk to the calves and was to some degree responsible for the scours in the young calves. A significant reduction in incidence of and deaths from scours was achieved by limiting the feeding of calves, other than colostrum, to milk from specially-fed "nurse cows". These animals were given a ration of 10 pounds good-quality hay twice daily together with low-level concentrate feeding of a mixture of palm kernel cake, corn meal, and crushed oats.

Calves were bucket-fed twice daily and weaned onto a milk substitute at 3-4 weeks. Shanks reported similar findings in calves fed on milk from cows grazing on new leys.[1] In this case, diarrhea had previously occurred when cows were first turned out to fresh grass. All calves which suckled or bucket-fed on their own mother's milk developed a thin, watery diarrhea and became listless. When nursing cows were moved to old orchard grass, scouring ceased in the calves. In one cow changed to dry feeding, calves fed from her milk ceased scouring. Inglis cites similar experiences where maternal dietary factors were linked with scouring in calves.[3]

While the evidence cited is based on clinical observation, there have been numerous calf experiments designed to test the scouring effects of variations of known constituents of a milk diet.

Blaxter,[3] Flipse,[4] Rojas,[5] Owen,[6] and others have noted at various times the laxative effect of the lactose constituent of milk substitutes. The ensuing high acid pH of intestinal contents appear to influence the bacterial flora. High mineral levels in milk replacers is an important factor in the production of diarrhea. Experimentally it has been possible to stop diarrhea in whey-fed rats by partial dialysis of the whey.[7] When the dialysate was restored to the whey feed, diarrhea again occurred in the rats. Milk fat, however, has an antilaxative effect and calves fed diets containing butter oil are less subject to scours than calves receiving oils of lower melting points.[8]

Avitaminosis A, B-Complex deficiencies, inhibition of curd formation, etc. are examples of other nutritional factors which have a definite bearing on the incidence of scours in calves.

Rationale of Treatment

Unfortunately, increased reliance on broad spectrum antibiotic therapy repeatedly ignores dietary background of the patient. With the exception of specific endemic or epidemic infections, e.g. *Sal. dublin* and certain serotypes of *E. coli*,[9] nutrition is the most important factor. The feeding of low-level tetracyclines may have a protein sparing and some growth stimulating effect, but in its relationship to scours it may in some instances compound the problem. Resultant changes in the bacterial flora can produce a real problem to the veterinarian in the form of antibiotic-resistant coliform organisms. Even the feeding of higher levels of antibiotics (250 mg. chlortetracycline daily from birth to four weeks) is fraught with the same danger.[10,11]

Care of the "Market Calf"

Purchase of calves 2-14 days of age presents a special problem. If the seller has committed the common crime of giving the calf a large feeding of milk before transport, the buyer is of course starting with one strike against him. He should avoid adding insult to injury and again distending the abomasum of his victim. A clean, dry pen and 3-4 pints of warm water and glucose is indicated. Subcutaneous injection of 50-100 cc. of serum from an adult cow or older feeder calves on the farm is excellent practice. The serum antibody content of adults on the new premises is peculiarly adapted to the needs of the calf in his new environment. The calf should be gradually introduced to a full milk diet over a period of 3-4 days.

Therapy

In the treatment of the scouring calf, the prevention of dehydration is of fundamental interest. The general introduction of electrolyte therapy has been a major advance

and is to be encouraged. Smooth muscle antispasmodics will play an increasingly important role in the stopping of fluid loss through control of excessive peristalsis. Where bacterial resistance to the tetracyclines complicates the picture, use of other antimicrobials such as Chloromycetin or Sterosan (Jen-Sal) should be tried. Prevention of death is not the only object of treatment, however. In looking at a bunch of hairy, potbellied calves, how many farmers have told their veterinarians that they would have been more profitable to him if they had died during the initial scour outbreak? It is therefore important to find effective treatment and return the calves to full feed as quickly as possible.

Freeman[12] has shown that intramuscular injection of ACTH will produce dramatic response in many cases of scouring in young calves. Apart from stimulating the production of anti-inflammatory steroids, he states that the anti-insulin effect of ACTH is essential in counteracting a coexisting hypoglycemia. Using a long-acting product he advises intramuscular injection of 1-2 cc. repeated in 24 and 72 hours will result in rapid response. Supportive antibiotic electrolyte therapy may be used as necessary.

In spite of the best available treatment, some cases will tend towards chronicity. It is good practice to wean these calves to a solid diet as quickly as possible and to use all available methods to stimulate rumen function. Under any circumstances, good-quality hay should be made available by the end of the third week, together with 2-4 oz. of concentrates.

When concentrate feeding is started, water must be made available and watering containers not allowed to sour with leftover calf meal or pellets.

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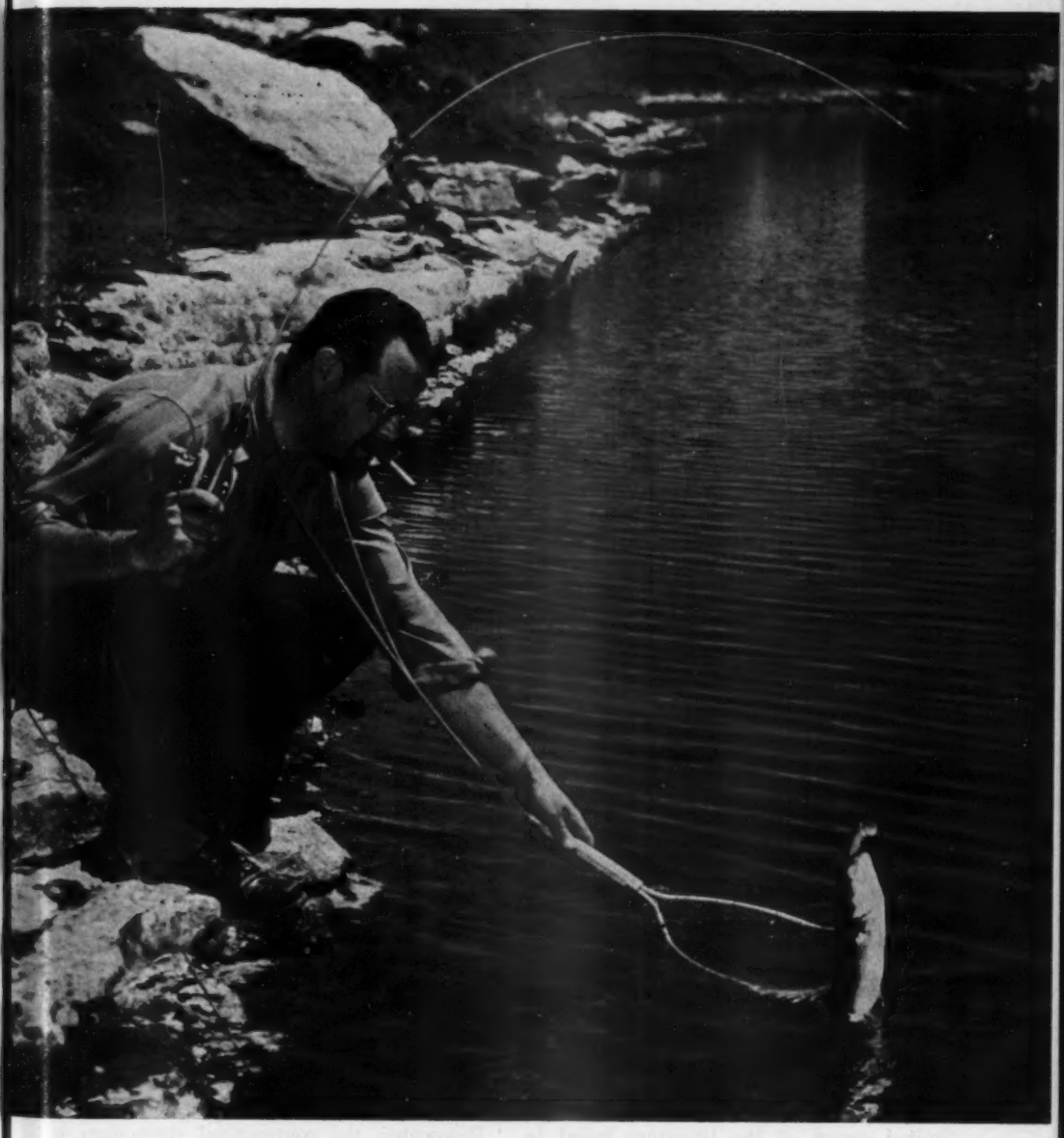
Opthalmology In Horses

During the years, the condition known colloquially as "periodic ophthalmology in horses" has been ascribed to a variety of causes. Probably the first and oldest designation was "moon blindness" because its periodic stages bore a fancied resemblance to the phases of the moon. Later, supernumerary molars (wolf's teeth) were accused. Heredity, nutritional disturbances, parasites, micro-organisms and viruses all had their day as etiological factors.

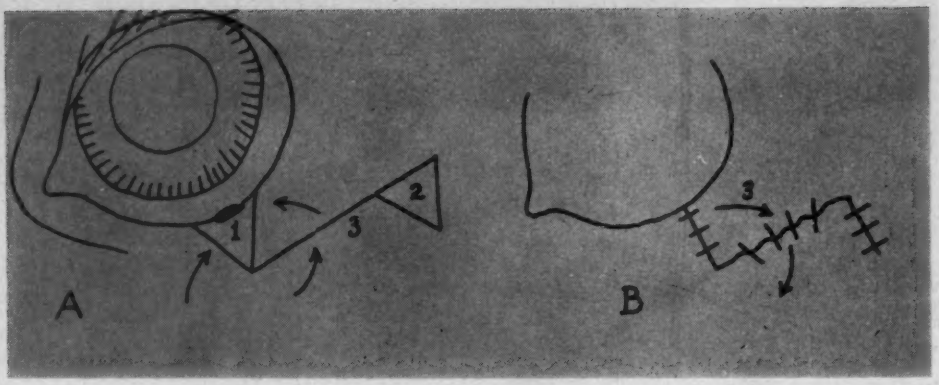
Within the memory of most of today's practitioners, when vitamins were in the ascendancy, riboflavin deficiency was in the forefront. Most recently *Leptospira pomona* has moved into the driver's seat. In spite of many years of commendable research, the disease continues to make its appearance. Total blindness is the usual final result.



A. V. M. A. Convention

August 14-18

Denver, Colorado



SURGICAL REMOVAL OF TUMORS FROM THE LOWER EYELID

J. E. ENGLISH, JR., B.S., D.V.M.
University of Missouri
Columbia, Missouri

Tumors of the lower eyelid occur quite frequently in purebred cattle. When there is no other involvement of the eye, surgical removal of the tumor makes it possible to retain the animal in the breeding herd. A limited search of the literature failed to reveal any reference to the operation which will be described. Some points of the operation were suggested by practitioners.

Anatomy

The lower eyelid of the bovine bears a considerable number of cilia, which are finer than those of the upper lid. The tarsal glands are more deeply embedded and therefore not so evident. The conjunctiva of the lower lid presents folds or ridges, and one or two prominences which contain numerous leukocytes; the conjunctival epithelium is transitional in type[1].

Tumors of the eyelids may be benign or malignant. Of the former, warts or papillomata are the most common; while the latter may be sarcoma, carcinoma or epithelioma[2]. Some of these tumors can be removed successfully by the following operation.

Technic

Frank describes an operation to remove a triangular shaped area of skin and conjunctiva from the lower lid, for correction of an Ectropion[3]. If we use an extension of his operation along with some additions we can remove tumors from the lower lid as follows and still have the animal's lid and eye appear about normal.

Drawing A of Fig. 1 is a diagram of the eye and eyelid with a small tumor present on the lower lid in triangle 1. The area is thoroughly washed, shaved and disinfected, and blocked locally with 2% procaine, or any similar local anesthetic.

A triangular area is outlined to include the tumor and section of the eyelid involved. You will notice that the base of triangle 1 includes the tumor. The incision is made along the sides of the triangle, the eyelid, and conjunctiva to include the tumor. The incision along the base is usually through the conjunctiva only.

After removal of triangle 1, an incision is made along line 3, Drawing A, Fig. 1, which is three times the length of the base of triangle 1. Then another triangle of skin is removed which is the same size as triangle 1 and identified as triangle 2.

Closure of these incisions is important in order to have an as near normal appearing lid as possible. The sutures are interrupted, starting at the apex of triangle 1. The edges are sutured together working down to the base of the triangle and the conjunctiva. The suture which is placed at the edge of the eyelid and conjunctiva, should be fine catgut to minimize the injury to the cornea by rubbing. The arrows, Fig. 1, show the direction of the tension placed on the skin. The number 2 triangle is sutured next, like number 1. This leaves the area along line 3 to be closed last, with interrupted sutures.

Discussion

You will notice in Drawing A, Fig. 1, that the arrows around triangle 1 would cause an Entropion. This suturing also raises skin dorsally along the line 3. When triangle 2 is sutured, this tends to open the incision along line 3, vertically, also placing some stress longitudinally. This leaves line 3 to suture, which has spread dorsally and vertically between triangles 1 and 2. A slight Entropion is now present. Now, by suturing line 3 we have a suture area which appears as Drawing B in Fig. 1. The arrows in B, Fig. 1, also show the direction in which tension is now being placed on the skin. This also corrects the Entropion which has been produced by the surgery and places the eyelid back into its normal appearance.

This operation has been performed on 15 to 20 animals by the writer, with good results and was demonstrated at the 35th Annual Short Course for Veterinarians, November 2, 1959 at Columbia, Missouri.

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Dr. Vaughn posts a transaction.

Efficient and accurate records are the backbone of a well managed practice. The procedure described here is in use in several veterinary practices. Adaptation appears to be equally satisfactory in both large and small animal practice.

Simple Mechanized System Eliminates Bookkeeping Confusion for Kentucky Veterinarian

Switching over from hand-posting on all accounts to a mechanized system of bookkeeping and collection of accounts has added a minimum of $10.00 per day to collections for Dr. J. Frank Vaughn, D.V.M., of Paducah, Kentucky. Before he devised his current system, built around a modern charge-posting register, he shared a problem common to many veterinarians — that of losing collections through sheer oversight. Too busy for the details of record-keeping, Dr. Vaughn was performing many services for which he failed to charge — simply because no time existed for posting the record of the service, and rendering the bill.

The objective of the system is to provide a complete account at the end of every day of the total volume and the activity in various departments. The system also furnishes a complete record of cash receipts, charge account postings, and all similar information.

The system hinges on a history card (Figure 1), the reverse side of which becomes the original ledger card for each account. This record originates at the first visit. On the history card are spaces for the date, the animal's name, a full description, vaccinations, license tag number, hematology report, urinalysis report, symptoms and diagnosis.

After the original information has been

History is on the back of the ledger card.

Date 1/25/60 Gabriel Case No. 9683

Owner's Name: Robert Joseph Address: 717 W. 19th St. Phone No. EX 9-4019

Date Entered Hospital: Date Discharged:

Specie: Feline Breed: mixed Sex: M Color: Black + White Age: 1

Rabies Vaccination: — Tag No.: Distemper Immunization: OK

Hematology Report: P

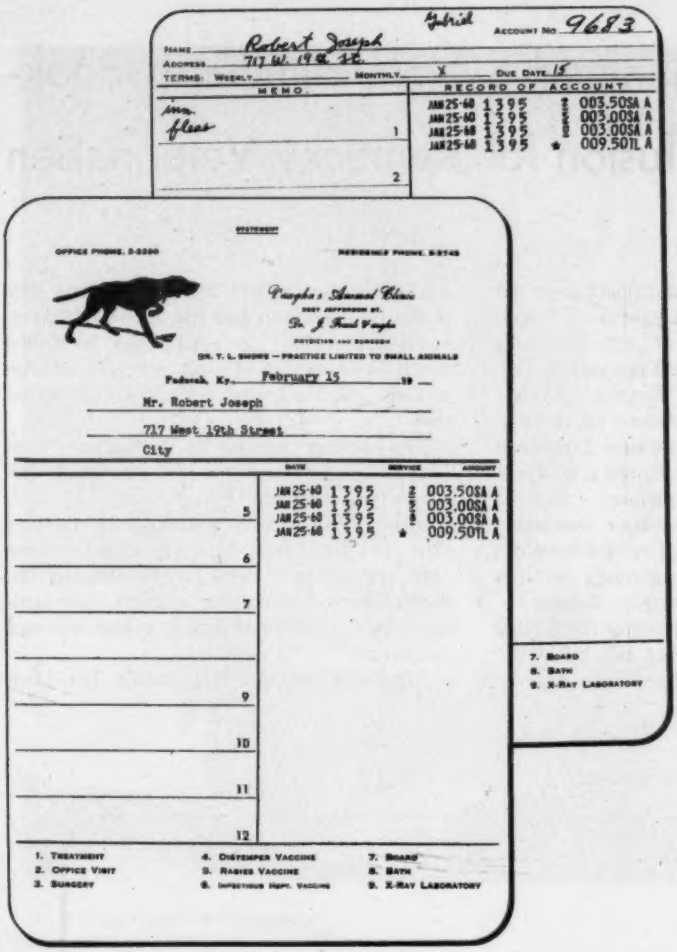
Urinalysis Report: neg

History: 4 yrs, flea bath

Symptoms: loss of hair, itching

Diagnosis: fleas

(Over)



Statement and Ledger are posted simultaneously. Computations are made mechanically.

entered, the card is turned over and an account number is entered on the top of the ledger card and printed on the other side. To simplify identification, the animal's name is usually written alongside the account number. This is also carried out on the statement, to help the owner identify which animal was treated, where several are concerned. The card on file thus represents a complete history of the animal's treatments during its entire life, as well as a history of services, charges, and amounts paid either by check or by cash during the patron's call.

Every transaction is considered a charge transaction whether the customer pays cash at once or sends a check on receipt of a statement. A record of every call is made on the combination ledger and history card, as soon as the service has been performed. For example, when a pet owner brings in a dog for distemper vaccination, the veterinarian pulls the card, makes a pencil notation of the charge and the service, and hands the history-ledger card back to the secretary, who immediately records the transaction on the register. When a patron pays cash, the transaction is recorded on

the register and then, without removing the ledger card, the amount paid is recorded as money received on account.

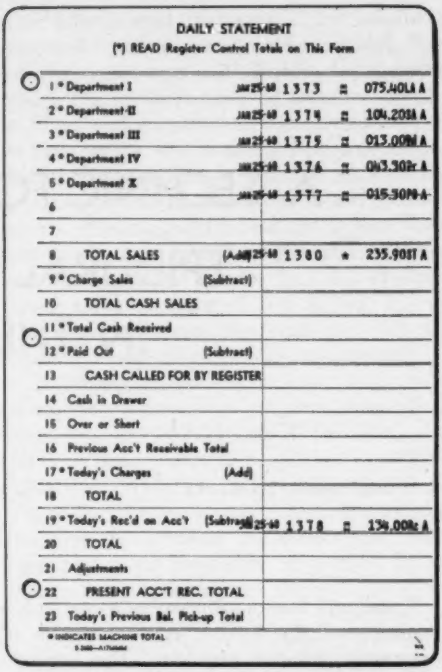
All of the alphabetized ledger cards on file in the Accounts Receivable file are considered "active charges" and each has a statement form attached. The statement is inserted in the register, and imprinted at the same time the ledger card is made out.

On the first of each month, the statement is simply slipped into a window envelope, and mailed to the patron. Payments received in the mail are posted directly to the proper ledger card.

With the combination ledger card statement, and simultaneous posting of both, it is a simple matter to look up the card assigned to each patron, insert the forms in the register, use the proper department key to record the type of service and the charges, and return the card to its place in the file.

Only the veterinarian himself resets the register, at which time a "Daily Report" form is posted (Figure 2). Totals are printed for large animals, small animals, board, and drugs, first. Then "Paid Outs" and "Payments Received on Account" are posted. The form is then removed, and the totals of large animals, small animals, board and drugs are listed on the statement key (which is simply an "add" key) and the total is printed beside the total services rendered. This figure represents the charge total for the day and is again put into the register in conjunction with the statement key and posted on the line marked "Today's Charges." The take-off form, when completely filled out, becomes the basis for close control over all transactions. All records of cash must balance to it.

Transaction counters in the machine provide Dr. Vaughn his departmental breakdown. He can determine if the number of transactions registered compare favorably to the transactions for the same month of the preceding year. He knows approximately how many clients he should service for any given month of the year, and any reduction or increase in the number will, of course, show up immediately. The system likewise will indicate any sudden increase in a specific department, such as boarding for example, which may indicate the need for



DAILY STATEMENT

(*) READ Register Control Totals on This Form

1 * Department I			1373	=	075.40LA A
2 * Department II			1374	=	104.20SA A
3 * Department III			1375	=	013.00BA A
4 * Department IV			1376	=	043.30Pr A
5 * Department X			1377	=	015.30MA A
6					
7					
8 TOTAL SALES	(Add)		1380	*	235.90TT A
9 * Charge Sales	(Subtract)				
10 TOTAL CASH SALES					
11 * Total Cash Received					
12 * Paid Out	(Subtract)				
13 CASH CALLED FOR BY REGISTER					
14 Cash in Drawer					
15 Over or Short					
16 Previous Acc't Receivable Total					
17 * Today's Charges	(Add)				
18 TOTAL					
19 * Today's Rec'd on Acc't	(Subtract)		1378	=	134.00Rc A
20 TOTAL					
21 Adjustments					
22 PRESENT ACCT REC. TOTAL					
23 Today's Previous Bal. Pick-up Total					

* INDICATES MACHINE TOTAL

Figure 2. Daily statement is prepared a few minutes after close. Illustration has not been completed so that machine printed figures can be more easily seen.

larger kennel space; or a sudden drop in any type of service may require investigation.

Dr. Vaughn's heaviest workload occurs between four and six each evening. Checking back on his bookkeeping system, he can determine how his time may be best allotted, the average receipt per call, and most important, that charges are made where due. It is in this latter respect that the average of $10.00 per day in additional collections has been developed.

Dr. Vaughn feels that it would be impossible to control his clinic under the present work load without mechanized bookkeeping. Now that all charges are properly made and controlled, there are no leaks due to oversight on his part or his employees and he can devote a considerably larger amount of time to his clients. With recordkeeping requiring only one-third as much time, the receptionist is free to devote much more time to correspondence, ordering, and personal attention to clients.

A TECHNIC FOR CONTINUOUS EPIDURAL ANESTHESIA IN THE BOVINE

C. J. BIERSCHWAL, D.V.M., M.S.

Tenesmus that accompanies acute vulvovaginitis of the bovine often presents an extremely difficult problem. The recovery of the animal may depend upon the control of straining, until the acute irritation subsides. In-place vinyl tubing in the epidural space provides a very satisfactory method for continuous epidural anesthesia to control tenesmus.[1,2,3]

Materials Required

A 14 in. length of vinyl tubing, medical grade, internal diameter 0.020 cm*; 17 gauge, 3 in. thin wall Touhy needle**; 23 gauge, ½ in. short bevel hypodermic needle; and a one-way stop cock, female Luer slip to male Luer slip† (optional).

Vinyl tubing has been found superior to other types of plastic materials used, both in facility of insertion and handling. It may be purchased in bulk rolls of 100 ft. or in predetermined individual lengths. The recommended method of sterilization is by autoclaving or boiling. Cold sterilization, utilizing Zephiran, alcohol, Merthiolate and Phemernite is contraindicated, as adhesive arachnoiditis may be the untoward sequela.[4] It should be remembered that this catheter may remain in the epidural space for a long period of time and the tubing must be aseptic. Where use of an autoclave is available, it has been found convenient to make up a sterile pack of the necessary materials. For field use, lengths of vinyl tubing (approximately 14 in.) may be boiled and placed in a dry sterile glass container. The needles and stop cock may be sterilized by boiling for ten minutes, then placed in any appropriate germicidal solution.

Technic

The sacrococcygeal space is the preferable site for the introduction of the tubing through the Touhy needle. The space between the first and second coccygeal vertebrae may be used, but it has been found that the former site better facilitates the placement of the tubing.

The author acknowledges the helpful suggestions and cooperation of Dr. K. K. Keown, Professor of Anesthesiology, Medical Center, School of Medicine, University of Missouri, Columbia, Missouri.

* Vinyl tubing, Becton, Dickinson Co., Cat. No. XV020

** 17 Gauge, 3 in. thin wall (Touhy) needle, Becton, Dickinson Co., Cat. No. T466LNRH

† One-way Stop Cock, Becton, Dickinson Co. Cat. No. L/S1

Figure 1. Thin wall Touhy Needle and One way Stop Cock. Arrow indicates curvature of bevel of needle, which better facilitates insertion of vinyl catheter or tubing.

The tail is gripped about six inches from its base and raised "pump-handle fashion." The first obvious articulation posterior to the sacrum indicates the sacrococcygeal space. The hair of the site is closely clipped or shaved, scrubbed with soap and water, dried and a suitable germicidal is applied. With a 19 gauge ½ in. needle, a skin wheal is raised in the medial position of the sacrococcygeal space, by the injection of 1-2 cc. of a 2% procaine hydrochloride solution, or any other standard regional anesthetic solution.[5] It is desirable to obtain adequate skin anesthesia prior to the introduction of the Touhy needle into the epidural space.

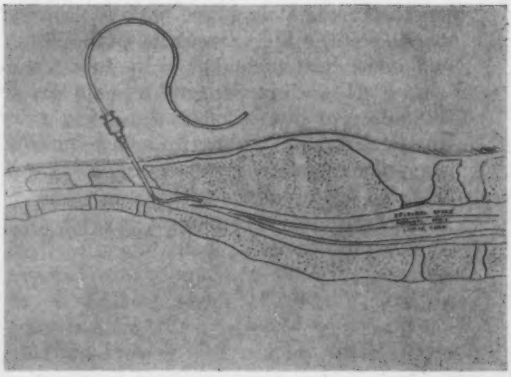
As the skin offers the greatest resistance to the passage of the somewhat blunt, curved 17 gauge Touhy needle, a skin puncture should precede the passage of the Touhy. An awl or standard bevel 16 gauge needle of ½ in. or longer is used to make the skin puncture. The 17 gauge Touhy needle, with stylet in-place, is inserted through the puncture wound in the skin, making sure the orifice of the needle is directed cephalad. Steady pressure is applied to the hub of the needle, thrusting it vertically, ventrally and cephalad at an angle of approximately 15 degrees through the fat and connective tissue beneath the skin and lastly the interarcrual ligament into the epidural space.

Some animals, especially beef breeds, evidence a distinct "feel" as the needle pierces the interarcrual ligament. The needle is inserted until it touches the ventral floor of the canal and withdrawn slightly dorsally. The stylet is removed from the needle; a 10 cc. syringe attached directly to the hub of the needle and a small test dose of the anesthetic solution is injected to test the proper position of the needle to the epidural space. Having ascertained the proper location, the vinyl tubing is threaded through the lumen of the needle into the epidural space for a distance of two to four inches. In most instances the catheter will encounter slight or negligible resistance.

If strong resistance is met, the needle should be repositioned slightly dorsally or ventrally. DO NOT FORCE TUBING. DO NOT PULL BACKWARD ON THE TUBING WHILE THE NEEDLE IS IN PLACE. If this is done, the catheter may impinge the bevel of the needle and cause shaving of the tubing or, if a bend in the tubing has occurred, the sharp edge of the bevel may sever the catheter, resulting in a portion being isolated in the epidural space. To accurately determine the length of catheter that is inserted into the space, a ballpoint pen may be used to mark the tubing prior to sterilization. Two marks are made, one 3 inches and the second 6 inches from the distal end (end of tubing to be inserted into epidural space).

The catheter is inserted through the lumen of the Touhy needle until the second mark at the hub (Figure 2). The needle

Figure 2. Schematic drawing of catheter being inserted through needle into epidural space.



may be readily withdrawn over the tubing by holding the tubing firmly about ½ in. beyond the hub and withdrawing the needle back in short repeated semi-rotating motions. After removal of the Touhy needle a 23 gauge, ½ in. needle is inserted into the epidural space. To keep the apparatus firmly anchored, two pieces of adhesive tape, ¾ in. wide and three inches long are applied (Figure 3).

Figure 3. Showing position of anchoring tapes to hold apparatus in position. These tapes have held adequately for 14 days.

The first anchoring tape is applied over the catheter about ½ in. anterior to the site of insertion and adhered to the adjacent haired areas. A second tape is applied to the stop cock needle combination, anchoring the apparatus to the dorsal concave portion of the pelvis, approximately two inches lateral to the spines of the sacrum and approximately three inches posterior to the point of the tuber sacral of the illium. To assure firm anchorage of the tape a thin coat of "Branding Cement"†† is applied to the adhesive surface of the tape, just prior to application. The area to which the tape is applied should not be shaved or clipped, so that the adhesion of the tape is to the hair. When tubing is removed the hair may be clipped from the tape.

The stop cock is not a necessity, but serves as a refinement to the operator and protects the lumen of the tubing from foreign material. If desired the 23 gauge needle that is inserted into the proximal end of the catheter may be used alone, providing the hub of the needle is sealed with tape after each infusion. Another method of protection that can be employed is by sealing the proximal end of the catheter with the flame of a match. Upon subsequent administration of anesthesia, the sealed end is clipped with scissors, the 23 gauge needle inserted into the lumen and the anesthetic solution injected.

It is possible to insert the catheter into the epidural space through a standard short bevel 16 gauge needle, but at times difficulty is encountered due to the tubing becoming lodged on the floor of the canal. This difficulty is rarely encountered with the 17 gauge Touhy needle.

After perfecting the technic in experimental animals, continuous epidural anesthesia has been used in the University of Missouri Veterinary Clinic as an aid in treatment of prolapse of the rectum, prolapse of the vagina, necrotic vulvo-vaginitis and obstetrical cases where prolonged delivery is necessary. It is felt that through its use, cases of threatened prolapse of the rectum and vagina have been prevented.

The technic is being used for experimental study of drugs and local anesthetics infused into the epidural space of the bovine.

†† Branding Cement, Nebraska Sales Co., Lincoln, Nebraska

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As director of the veterinary clinic at Kansas State University, Dr. Frick's long range viewpoint and sage observations on practice economics have helped many a student and young veterinarian along the road to success. Here he looks at our professional heritage—past and present—and offers a few predictions for the future.

CHANGING VETERINARY MEDICINE

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My only authority on the subject of changing veterinary medicine is that I have been a spectator of the changes in the profession for over forty years, graduating some seventy men a year, watching their activities in the profession and attending numerous professional gatherings where these changes are discussed or become apparent. To properly cover such a subject assumes a knowledge of the past, an understanding of the present, and some imagination for the future.

The Past

Veterinary medicine in the past was dependent entirely on agriculture. My early observation and activities of the profession began in the horse and buggy days. We used a horse and buggy on ambulatory calls at the Kansas State College (now University) until 1921. Those were the days when the horse was king and the principal patient of the veterinarian. Those were the days of fistulous withers, pollevil, shoulder galls, grease heel, colics and equine dystocia, especially in the heavy draft breeds. Those were the days of great leaders in our profession, men like Dykstra, Williams, Adams, Law, Merrilat, Campbell, Hall, Eichorn, Mohler, Curtis, Kinsley, and a host of others that it was my very great privilege to know. In judging those days, remember most of the profession had but two or three years of training at school, often after starting with a deficient pre-college education. There were no sulfonamides, antibiotics, vitamins or hormones and many of the drug preparations used were homemade. Yet under the leadership of that time the veterinary profession rose to great heights. The mantle of "hoss doctor" was shed in spite of being outnumbered by quacks, and the profession managed to maintain a forefront with medical, legal and all other professions, in service and accomplishments second to none. We have much in our past of which to be proud. Many of today's crop of veterinarians either forget or never appreciated what these men did for them. They

simply accept the good professional inheritance as something due them with no great obligation to carry on or seeming effort to improve what others before them have built. Yes, we owe a great deal to the old timers. Let us not forget what they have done for us, and for the profession of veterinary medicine.

The Present

Present day professional problems are no more difficult to solve than former ones. They are only different. The present day veterinarian has more and better training than his forbears. Most present day practitioners have college degrees plus four years of professional training or at least six years of college education on top of a good high school education. This is costly in time, money and effort and therefore demands a higher scale of living than that of the veterinarian of former days. Today's professional rewards are greater and come with less effort than those of our predecessors. However, the profession of veterinary medicine has changed, is changing, and will make some greater changes in the near future. The profession of veterinary medicine is rapidly branching out into new fields and specialization is developing. We now have men who treat only Greyhounds or only cats, or only race horses or specialize in birds. The cohesive unit of the veterinary profession is in danger because of some of these changes. In the field of practice we have special major branches. Take the small animal practitioner. Here the veterinarian invests in a very expensive building. Today's small animal hospitals oftentimes can be favorably compared with many human hospitals. The fact that human hospitals seldom operated in the black in spite of free labor and grants is often overlooked in justifying some of these buildings. Because of the high overhead, the most modern methods, equipment, and highest professional attainment of skill in our profession, the client's cost comes high. So high that there is danger of pricing oneself clear out of the market. The opportunity for racketeering in this field of sentiment also needs consideration. That the small animal specialist represents the highest development in our professional skill is obvious. That it has the highest financial returns is also plain. That they render a needed service goes without question. However, the common ground between the small and large animal practitioner is becoming less clear.

The large animal practitioner is still close to agriculture and its problems. His work requires much physical effort and oftentimes long hours of driving. He often is overworked or he may find himself in a position where he allows himself to think he is unable to compete with many present day changes such as medicated feeds. For years I have been advocating the group medicine or clinic practice as the answer to many of today's changes. Today's progressive veterinarians are more inclined to work together. Sectional meetings have helped break down the common professional animosity and jealousy that used to prevail over much of our profession. Cooperate we should if we are intelligent, and cooperate we must if we are to prosper. Two or more heads are better than one and pooling abilities gets better results. Clinics have problems but they afford a better way of life and service a larger area more completely. In the human field exhaustive surveys have shown that an average of $11,000 net by the single physician was raised to $17,000 when grouped in a clinic.

Those large animal practitioners who have kept abreast of the times are prospering but a goodly number have not advanced with the times and agriculture in those areas is and will continue to suffer.

The other branches of our profession I shall group as the non-practitioner group. This includes the public health, research, military, educators, and commercial workers. These fields are expanding and rightly so, but please do not forget the practitioner is the backbone of our profession, for without him I doubt if we would have a profession. Certainly the various military, research, state and other workers would seem to give first allegiance to their organization and

many of them accept recognization as other than veterinary professionalism. This non-practitioner group has less financial outlay, may have less remuneration but has more free time and greater promise of security.

All these fields of veterinary activity are needed to make a strong profession, for we are not a large numerical group even if we are essential to the national welfare. Today the commercial houses have largely taken the lead in veterinary education and development. The educational field has not stayed in the forefront of our professional advancement. Its budget has not allowed for the best equipment or employment of the most outstanding members of our profession. Its competition has been almost non-existent compared to other fields and its prestige has fallen into a neglect that will be costly for future results. The remedy must come from the entire professional field and we must be a united profession. In a growing, expanding economy our essential veterinary service is in demand and today's only problem is how one would want to supply it. Practically every field of veterinary endeavor has positions available today and usually our best young men take the best opportunities.

The Future

And now to discuss the less familar future of veterinary medicine. Some of what I shall say is predicated on fact and much on guess work or fiction. Certainly integrated agriculture is here and as it succeeds there will be more of integration. It is also certain that to be successful integration needs trained veterinary supervision, especially in the nutritional area of disease and its prevention. Agriculture is becoming big business and big business demands and pays for results.

Public health, now second only to national defense in our national budget, will become even more important and the veterinarian should be a key figure in that picture. Modern transportation speeds exchange of more goods and people over the entire earth, and this alone will necessitate more controls and programs of world disease eradication. We no longer shall vaccinate to live with a disease but eradication of that disease from every corner of the earth will and should be in order. Laboratory equipment will become more expensive, more complicated and more accurate and exacting in its results. With the assembling of more detailed information about a disease problem the judgment of a trained veterinarian will still be necessary. Use of new developmental technics and problems originating in the technical fields of advanced physics will use animals and veterinary supervision as their first step. Recent suction apparatus for dystocia, X-ray therapy under oxygen for cancer cell destruction and exact age determination by examination of an animal's lenses, are only minor examples of newer knowledge. Organized research will be more obvious in the future. Much more cooperative action will be the rule. Today we have a few such examples such as the biologist, anatomist, and medical researcher collaborating with the clinician to establish basic findings in reference to hair loss, growth and regeneration. With the new evidence relative to metabolites, pigment formation, hormonal control, and histochemical and biochemical application, a more complete understanding of the behavior of hair growth, loss, and regeneration will be achieved. With the improvement and addition of new laboratory aids and technics such as the electron microscope, chromatograph, spectrophotometer, and potentiometer, unknown vistas are being opened and mysteries clarified. Additional knowledge is being accumulated from the investigative use of radioactive tagged sulfur, cysteine, methionine, related amino acids, and trace minerals.

Scientific Advances

Knowledge of newer chemical actions and their effect on animal and plant products is a future veterinary activity. Atomic medicine is only being born. Nuclear powered farm machinery, tractors, combines, etc. that process farm products right in the field are not impossible. The X-ray and other

forms of radiation therapy are still in their cradle. Much of today's way of life and methods of living will be different whether we like it or not, and we must accept what seems to be a better way.

I well remember Thomas Edison, born 1847—died 1931, leaving 1300 patents; and what he helped electricity do will also be done by others with equally beneficial media and enormously improved results. Humans have their failings, but over a period of time one never could sell them short in spite of abstract art and rock and roll. As long as we have humans and animals, veterinary services will be needed.

Greater specialization in all new fields of veterinary endeavors is logical. Problems of soil, water and air pollution come in the realm of veterinary investigation and we need to show interest in those fields and problems to have them rightly referred to us. Too often we have been "Johnny come lately" such as in the field of the diseases of poultry, fish, zoo and the fur animal industry.

Animal psychology will be greatly developed even to the point of understanding and talking to animals in their own language. Dr. Chapman, former director of Washington, D. C. Zoo, has already discovered a monkey language and can understand and converse with some. Better understanding as to why neurotic people tend to have neurotic animals and fat people obese pets will come.

Newer drugs are certain to be more effective in their action and also more rapid in their effects. Perhaps a two-way television in color will allow a field diagnosis without leaving the office, if the farmer carries his set to his barn to show you the patient. Better metals, plastics and other new materials will give us better equipment and tools to work with. Advanced visual education will do a better job of education in less time than today.

Much of the difficulty that recent graduates have to adjust to in actively becoming part of the profession is due to their lack of economics, tax knowledge and general business understanding. This is beginning to be included in present curricula but a great deal more will be added so the future graduate will have good business training.

Perhaps the veterinary profession needs a new advertising media. Today's business does not seek an unnamed better product—regardless of the better mouse trap story of yesterday. People today buy Brand names. Today's animal owner is usually well versed on the business of raising the animals he has and tomorrow's veterinarian must be an expert in that field and let him know it.

Tomorrow's veterinarian must be cooperative with his professional brother. Tomorrow's veterinarian will be greatly needed and appreciated. I have never known a veterinarian to lose his shirt if he would roll up his sleeves. Veterinary medicine has always been a most interesting field to work in. I believe it always will be. Veterinary medicine has always afforded a good living to those trained and willing to work. Veterinary medicine offers an opportunity to shape your life work to the alleviation of human and animal suffering. What more worthwhile life work could you ask for?

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THE FORMOLGEL TEST—AN AID IN DIAGNOSIS OF PYOMETRA

EVERETT J. COLE[1], B.S., M.T., M.S.
Aa. THORDAL-CHRISTENSEN[2], D.V.M.

The formolgel test was first applied by Gate and Papacostas[1]. It was observed that the addition of formalin to Wassermann-positive sera resulted in coagulation for a high percentage of the specimens. A similar high percentage of Wassermann-negative sera failed to coagulate and the authors suggested that the reaction was due to an abnormal content of protein fractions in the serum.

It has been found by some authors[2,3,4,5] using Kjeldahl analysis and electrophoretic studies that the capacity of the serum to coagulate after the addition of formalin is related to a hyperglobulinemia.

Today the test has only a limited application in human medicine since the test has

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This work was done at the School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

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2. On leave of absence from the Department of Special Pathology and Therapeutics, The Royal Veterinary and Agricultural College, Copenhagen, Denmark.

been replaced by electrophoretic methods.

In veterinary medicine the test has been applied by Bing and Christensen[6] and Bendixen[7] among others. These former authors found the test suitable in horses and cattle for the diagnosis of chronic inflammatory processes such as bronchopneumonia, pericarditis, pleuritis and pyelonephritis. Bendixen studied the relationship between the serum proteins and the formolgel reaction in sera of cattle with various diseases by use of paper-electrophoretic technic and total nitrogen and non-protein nitrogen determinations. A close correlation was demonstrated between the amount of gamma-globulin and the gelification time.

It is the purpose of this study to evaluate the usefulness of the formolgel test as an aid in the diagnosis of pyometra in the dog.

Materials and Methods

The serum samples tested originated from cases of pyometra and endometritis which were diagnosed clinically and confirmed by surgery.

The formolgel test was carried out by adding 2 drops from a Kahn pipette of 36% formalin to 1 cc. blood serum. After thoroughly stirring, the mixture was allowed to stand at room temperature. Examination for coagulation was carried out by tilting the test tube at 10 minute intervals for the first two hours and thereafter at 3, 6, 12, and 24 hours after the addition of the formalin. The first sign of coagulation is an increase in viscosity. The coagulation was considered complete at the time the mixture had attained the consistency of coagulated egg white and would remain in the tube when inverted.

Since formaldehyde solution may contain formic acid which will retard the reaction[8] the solution should be previously neutralized by the addition of sodium hydroxide or calcium carbonate.

Blood samples were simultaneously examined for sedimentation rate, white blood count, and hemoglobin content. Examination was carried out for protein components of the serum by the paper-electrophoretic method.

Results

During a period of approximately 4½ months, ten dogs varying in age from 2½ to 15 years were examined. There were histories of recent parturition, pseudocyesis or symptoms of heat in the weeks prior to admission. All dogs evidenced symptoms of pyometra; namely, a disturbance in general condition and discharge from the vulva; an abdominal distension was present in eight cases. A further indication of pyometra as found in eight dogs was a leukocytosis. Increased sedimentation rate was found in six cases. The uterus was greatly enlarged in seven cases while in three cases, the enlargement was either moderate or slight. By means of the formolgel test, a coagulation time varying from 20 minutes to 20 hours was encountered.

TABLE 1.

Clinic No.	Age (Yrs.)	Duration of Symptoms (Weeks)	Purulent Discharge from Vulva
90009	15	2	+
90257	12	2	+
91249	8	4	+
91410	12	2	+
91456	2½	2	+
91573	9	8	+
91602	10	1	+
92921	11	1	+
93150	12	2	+
93478	7-8	?	+

The formolgel test has been performed with serum from 25 control dogs not showing signs of endometritis. No coagulation appeared during an observation period of 24 hours.

Discussion

In addition to the clinical examination, which in itself usually gives conclusive re-

Physical and Laboratory Examination of Dogs With Endometeritis and Pyometra

Abdomen Distension	Typical Enlargement of Uterus	Blood Sedimentation Rate (mm.) 15-30-45-60 (Minutes)	W.B.C. 1000/cu.mm.	Hemoglobin (Gms.)	Formolgel Test Time for Coagulation	Electrophoretic Serum Protein Pattern
+	+	20 45 75 118	36.9	9.5	25 min.	Increased globulin
0	Moderate				20-25 min.	Increased globulin
0	Endometritis	0 1 2 3	14.3	16.7	No coagulation*	No increase in globulin
+	+	3 17 35 45	39.7	13.1	20 min.	Increased globulin
+	+	2 3 5 9	22.9	16.0	30 min.	Increased globulin
+	+	6 35 73 91	42.1	14.8	160 min.	Increased globulin
+	+	5 18 37 55	18.0	16.0	15 min.	Increased globulin
+	+	3 9 22 40	44.9	15.0	18 hours	No increase in globulin
+	+	1 7 24 64	25.9	14.1	20 hours	Test Not Run
+	Endometritis	0 0 0 1	20.3	14.8	18 hours	Test Not Run

*Within 24 hours

sults as to the diagnosis of pyometra, the demonstration of a leukocytosis has found routine usage as a method for confirming the diagnosis.

This study, which is of a preliminary nature, does not include other conditions in which there may be accumulations of purulent exudate in body cavities. Since these conditions are rare in the dog, it is felt that the formolgel test may be of help in confirming a diagnosis of pyometra. A positive formolgel test may be considered more indicative of pyometra than a leukocytosis which is present in the acute stage of several conditions in the dog.

Summary

1. Sera from eight dogs with pyometra and one dog with endometritis showed a positive formolgel test, while in one dog with endometritis the test was negative.

2. Sera from 25 control dogs not having signs of endometritis showed a negative formolgel test.

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Old dog with heavy tartar accumulation.

DOG BISCUITS AND CLEAN TEETH

LEON F. WHITNEY, D.V.M.

Over the years the author has noted that dogs fed on hard biscuits and flat bones seemed to have the cleanest teeth.

Based on observation and opinion, dog owners were advised that while bones were constipating, an occasional soft rib bone or large dog biscuits would be beneficial. It was decided recently to conduct a controlled test using old dogs with heavy tartar accumulations to determine whether hard dog biscuits could actually remove tartar, and if so, how long it would take.

Six Beagles were used in the experiment. Three controls were fed their usual soft diet. Their teeth were photographed. Three test animals were fed large-sized hard-baked dog biscuits. It was felt after watching dogs eat small-sized biscuits that they did not have to chew them as much. The biscuits measured 4¼ in. long and ½ in. thick, with knobs on each end, resembling most dog owners' idea of the shape of a bone.

The biscuits were the exclusive food of the three Beagles for three weeks. Water was furnished in buckets, not in pans into which the dogs might drop the biscuits where they could soften.

The teeth of one dog were all sound

Practically all tartar removed after feeding only hard biscuits.

except for some retraction of the gums due to tartar accumulations. Another dog had a loose premolar, the third a dead molar.

All of the dogs were carefully watched as they ate. It was interesting to note the careful manner in which the dog with the loose premolar ate. The dog with the dead molar always chewed on the opposite side of the mouth. At the conclusion of the three weeks, photographs were again taken.

Results

The dog with all sound teeth removed practically all of the tartar. The heavy accumulation on the molars was all gone and only slight staining remained even on the canine teeth. The dog with the loose premolar cleaned only the canines; parctically no tartar had been removed from the molars. The dog with one dead molar showed some reduction of tartar on the side with the dead tooth, but the sound side was completely tartar free. The controls showed no change.

Following this test, the remaining biscuits were fed to Redbone Coonhounds which were 7 and 8 years old. They had been raised and maintained on a soft diet and had complete sets of excellent teeth, despite varying amounts of tartar accumulation. With their powerful jaws they crunched the biscuits effectively and within two weeks had removed all traces of tartar.

Discussion

The use of hard dog biscuits removes tartar effectively. They prevent gum regression without the constipating effect of bones. Biscuits which dogs can chew, not only tend to keep dogs' teeth tartar free, but actually remove tartar. Dogs with loose or dead teeth suffer pain from pressure and will not be improved until defective teeth are removed.

Children and Their Pets

CORNELIA MORSE CARITHERS, M.D.
Jacksonville, Florida

Although this paper is concerned with the relationship between diseases in children and their pets in the United States, the problem is much the same in all countries of the Americas. It varies only in content from country to country as it does also from locality to locality within a country. The problem is increasing each year as the pet population increases. Children live intimately with their pets, playing with them, kissing them, sharing their food, and sleeping with them.

Available figures indicate that this country's pet population is increasing by almost a million a year. Table I† gives estimates of the dog and cat population of today. The figure on cats is especially liable to be inaccurate as cats frequently move from home

TABLE 1. Estimates of Pet Population in the United States

Source	Year	Dogs	Cats	Birds
American Institute of Public Opinion (Gallup Poll)	1956	24,576,000*	20,064,000*	11,760,000*
American Humane Association	1956	25,000,000	35,000,000	
All-Pets Magazine, Inc.	1956	27,000,000	28,000,000	19,000,000†
National Family Opinion, Inc.	1953	22,600,000‡	26,700,000§	

* Dogs in 16,800,000 homes; cats in 10,080,000 homes; birds in 7,680,000 homes.

† Includes 14,500,000 parakeets.

‡ This figure is in contrast to an estimate of 17 million dogs made in a similar study in 1947 and represents an increase of about 900,000 dogs for each of the six years.

§ Cats living on home premises, with 29% of the country's total number of families owning one or more cats.

to home or live temporarily or even permanently without homes. One authority thinks that half the cats in the United States are unclaimed. The tenfold increase in parakeets in this country in the last five years reflects the continuing craze for these pets. In addition to dogs, cats, and birds, children have many other pets in lesser numbers, such as rabbits, squirrels, hamsters, and rats.[1]

The increase in the pet population is partly attributable to the longer life expectancy of dogs and cats through improved diet and more and better veterinary care, both of which are related to the economic factor of a rising national income. In number and variety there are more pets in rural than in urban homes. In our practice, my associates and I questioned a consecutive series of 300 parents, who brought their children for routine pediatric care, about pets in the home. The replies showed that 94.8% of the children were intimately exposed to dogs and 90.4% to cats (table II†).

Bites, Infections, and Diseases

Many medical problems may arise from the close relationship between children and their pets, one of the most common and troublesome being that of bites. Of the 300 families interviewed, 15.4% of their 531 children over the age of one year had been bitten at some time by a mammal and 2.1% had been bitten more than once. Among other considerations, this is a problem for accident prevention. In a 20-month period there was reported to us in our practice a total of 157 children bitten by various animals.[2] Most of these children were between the ages of two and ten years. (Children under two years of age are better protected by the adults around them, and children over ten years are more discreet in their handling of pets.)

Many infections of animals may be transmitted to man in any of several ways. These infections may be viral, bacterial, fungal, or protozoal. Since it would be impossible to discuss these diseases in detail, brief mention of some of the possibilities will be followed by discussion in more detail of one problem that has recently come into prominence.

TABLE 2

Results of Questionnaire Submitted to Three Hundred Parents of Children Receiving Routine Office Pediatric Care

	No.	%
Number of children	617	—
Over 1 year of age	531	—
Families owning		
Dogs	107	35.6
Cats	48	16.7
Parakeets	58	19.3
Children intimately exposed to		
Dogs*	585	94.8
Cats*	558	90.4
Veterinary care for		
Dogs	68	63.5
Cats	13	27.0

* Animals in own homes or homes of relatives or friends where child visits.

† Tables I and II originally appeared in *Pediatrics*, and are reprinted with that journal's permission.

Viral diseases acquired from pets are probably much more common than realized. The problem of rabies, as well as that of tetanus, must be considered in every instance in which the bite of a pet is reported to a physician. The recommendations of the World Health Organization's Expert Committee on Rabies[3] and the Report on the Control of Infectious Diseases of the American Academy of Pediatrics[4] are valuable guides in deciding whether or not to give serum or vaccine.

Psittacosis is endemic in many kinds of birds. In about 60% of cases reported in the United States the disease follows exposure to pet birds, and in 40% to domestic fowl and wild birds. With a parakeet now in every fifth home in this country, psittacosis could well become an epidemic problem.[1] Federal regulations on interstate shipment seek to avoid this danger.*

The encephalitic viruses, harbored mainly in birds, horses, and mules, and transmitted to humans by ticks and mosquitoes, can be presented artificially to other domestic pets. Thus these diseases may conceivably be transmitted to man and become a greater menace to children.

The encephalomyocarditis group of viruses occurs commonly in hamsters, guinea pigs, and, sometimes, squirrels. Lymphocytic choriomeningitis is usually acquired from rodents, but has been reported to be also acquired from dogs. It is now even reported that dog distemper and a respiratory disease of human beings are related. The discovery of mumps antibodies in dogs has also been reported.

With regard to bacterial infections, numerous investigators have made cultures of the gastrointestinal tract of healthy dogs and found that a significant percentage harbor various salmonella organisms. It has been established that these pet-borne organisms can cause epidemics. Brucellosis, anthrax, and tularemia rarely occur in this country but can be transmitted from domestic pets of a wide variety. Dogs and cats can acquire tuberculosis from close contact with infected human beings, and the tubercle bacilli may be recovered from their stools and saliva, thus making them a potential source of the disease. Kittens can be infected with diphtheria bacilli.[1]

The relationship between fungus diseases in animals and man is not clear. Most of the systemic mycoses that may cause disease in man also occur in animals, more often in horses, cattle, and swine than in dogs and other pets. Superficial fungus diseases in man are caused most commonly by *Microsporum lanosum* or *M. audouini*. The latter has for years been credited with causing the human type, but it is now known that this organism will infect animals and therefore can return to man from an animal source.[1]

Cutaneous larva migrans has long been seen in the southern coastal areas of this country, but it is now known also that the ingestion of the larva of dog and cat ascarides can cause a severe systemic type of disease called visceral larva migrans. Better care of pets, including frequent worming, would reduce the incidence of these diseases.

Dogs are second only to rats and mice as a reservoir from which man acquires leptospirosis. *Trichinella spiralis* can infect dogs and cats as well as other mammals, although swine are the chief source of trichinosis in man. Human beings can acquire dog tapeworm by swallowing infected fleas. The mange mite infects man's skin only rarely. Fleas, however, are transmitted freely from animals to human beings and are a major cause of papular urticaria in children.

The subject of allergic children and their pets deserves separate consideration. It is appropriate to comment here, however, that no allergic child should own a feathered, furred, or hairy pet.

Cat Scratch Disease. Cat scratch disease, first described by Debré and his associates[5] in 1950, doubtless had existed unrecognized for many years. Forty to 50% of reported cases have occurred in the pediatric age

(continued on page 62)

* Since this paper was presented, announcement has been made that Aureomycin-treated feed, which will keep parakeets free of the psittacosis virus, is now commercially available.

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(continued from page 60)

most frequently in children because of the greater contact. There is no sex or seasonal variation. In 83% of 300 reported cases a cat was found to be the source.* The cat harbors this virus without any signs of illness and is apparently able to transmit the virus for weeks or even months.

The site of the scratch shows first a papule, then a vesicle, followed by a pustule, and finally a crust that may last many days. Both the primary and secondary regional lymph nodes become progressively enlarged. The swelling may last for months and be either nontender or painful and even fluctuant. General malaise is usually present. Fever is highly variable. Anorexia, nausea, headache, and chills occur. Rarely, a faint rash may be present. Atypical forms occur when unusual inoculations are given.

The course is variable but usually benign, and the prognosis is good. Blood counts are not helpful. Therapy is purely symptomatic. Skin testing for establishing the diagnosis of this disease is handicapped by the small amount of antigen available for this purpose, none of which is commercially available. An agglutination test is a possibility for the future.

Summary

With the growing pet population, the magnitude of the problem of diseases in children, acquired from their pets, has increased. Viral, bacterial, fungal, and protozoal infections are not uncommon, and cat scratch disease, first described in 1950, has been reported frequently in recent years.

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* Presented at the VI Congress of the Pan American Medical Women's Alliance, Miami, Fla., on April 16, 1958.

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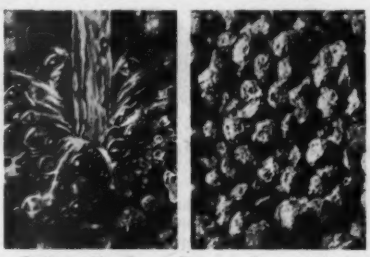

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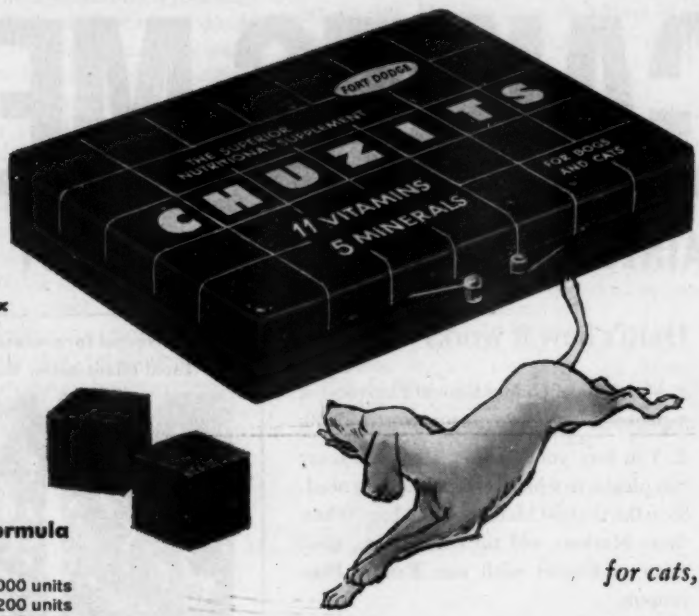

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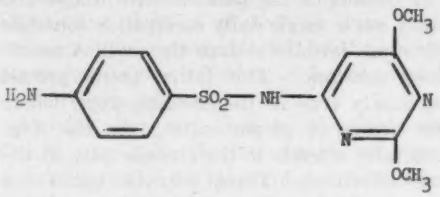

Sulfadimethoxine

A New Sulfonamide For Small Animal Practice

JAMES G. FISH, JR., D.V.M.
Jacksonville, Florida

While the sulfonamides have long been used in animal therapy, their use in recent years has been somewhat neglected because of the popularity of the antibiotics. In many instances, however, the sulfonamides are equally effective and are less costly.[5] The greater solubility of the sulfonamides has resulted in lower toxicity. It is no longer necessary to force fluids.

Sulfadimethoxine (Madribon—Hoffman-LaRoche), a comparatively new sulfonamide, maintains adequate serum levels for 24 hours following a single daily dose. It is rapidly absorbed from the intestinal tract,[1] and is found in the serum and tissues mostly as the free and active form. It is excreted primarily as the highly soluble glucuronide[7]. This reduces greatly the possibility of renal damage and also accounts for the long-acting effect of the sulfonamide. It exerts a marked degree of activity against a broad range of bacterial pathogens such as: *B. proteus, E. Coli, Ps. aeruginosa,* Salmonella, shigella, pneumococci, and some of the staphylococci and streptococci[3,4,8]. It has been shown by Randall, *et al.*,[10] that dogs receiving 40 and 80 mg./kg. for 90 days had no changes in weight or hemograms, nor was there any histologic evidence that could be attributed to drug toxicity. Sulfadimethoxine is an odorless and tasteless compound.

Materials and Methods

Sulfadimethoxine was administered to 308 dogs with a variety of infections including tonsillitis, pharyngitis, generalized upper respiratory infections, distemper, bronchitis, pneumonia, abscess, pustular dermatitis, sinusitis and metritis. They are listed in order of the number of cases treated (Table I). Dosages of the drug were determined by body weight and severity of the illness. Maintenance doses ranged between 6.5 to 15 mg./kg. after an initial dose of twice that amount. The drug was administered orally once daily. In dogs with bronchitis, sulfadimethoxine suspension was mixed in suitable amounts with liquid cough medicines which were administered on a four to six hour schedule. A small percentage of the more acute cases were given a single injection of penicillin-streptomycin or neomycin at the beginning of therapy. Duration of treatment with sulfadimethoxine ranged from 5 to 15 days. The dogs were observed several times during the course of treatment for signs of improvement. Medication was prescribed with specific instructions for administration to dogs treated by their owners.

Discussion

The single daily dose feature of sulfadimethoxine provides important advantages to the veterinarian: (1) blood levels are maintained at a higher, more uniform level than is possible with the older types of sulfonamides and some of the antibiotics; (2) owners of the patients will accept and carry out a single daily medication schedule far more faithfully than they will a multi-dose schedule. The latter point proved especially true in the hunting dogs, where the owner or person caring for the dogs generally attends to their needs only in the late afternoon. These animals could not have been placed on multiple-dose therapy at home, but would have required hospitalization. The client acceptance of the single daily schedule of medication cannot be overemphasized.

Another factor to be considered is the relative cost of sulfadimethoxine compared with the broad spectrum antibiotics which we had been accustomed to using previously for the infections encountered in this study. More than one client expressed gratitude over the economy of treatment. From a therapeutic viewpoint this may appear unimportant but in reality it may mean the difference between therapy and lack of it.

Summary

Sulfadimethoxine was administered to 308 dogs with a variety of infections. Maintenance doses, which were half the starting doses, were 6.5 mg. to 15 mg./kg.

Recovery was complete in all 12 dogs with abscesses, while five dogs with sinusitis, two with metritis, 21 with bronchitis and seven with pustular dermatitis completely recovered or markedly improved following therapy. Of the 93 tonsillitis and 72 pharyngitis cases, 96 and 95% respectively had completely recovered or were much im-

TABLE 1. Results of Treatment in Dogs with Sulfadimethoxine

INDICATION	NUMBER OF DOGS				
	Total	Complete Recovery	Improved	No Change	Worse
Tonsillitis	93	75	14	2	2
Pharyngitis	72	62	7	2	1
Generalized upper Respiratory Infection	58	45	4	4	5
Distemper	24	4	3	1	16
Bronchitis	21	18	3		
Pneumonia	14	12		1	1
Abscess	12	12			
Pustular dermatitis	7	6	1		
Sinusitis	5	5			
Metritis	2	2			
TOTALS	308	241	32	10	25

proved by the end of five to seven days. Eighty-five percent of the 14 dogs with pneumonia recovered and 84% of those with upper respiratory infections either recovered or markedly improved.

Results were not good in distemper although sulfadimethoxine controlled secondary bacterial infections of the distemper-complex as well as any other antibacterial agent.

Vomiting in one dog, the only side effect encountered, ceased upon discontinuation of the drug. These results are in accord with those of Johnson and White[6] who had a 90% favorable response with sulfadimethoxine in 101 dogs and cats.

Sulfadimethoxine appears to be an extremely effective drug for the treatment of bacterial infections in dogs. Aside from its therapeutic efficacy, its economy and ease of administration recommend its use.

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Illinois Zoonoses Center Established

Plans and funds for establishment of a Center for Zoonoses Research at the University of Illinois, to be activated Sept. 1 (1960), have been approved by the Board of Trustees on recommendation of President David D. Henry.

The Center will be first of its kind in North America and will be established to provide for research on the zoonoses, scientific name given to those diseases which are transmissable between animal and man.

Only other comparable facility is the Pan-American Zoonoses Center established in 1956 at Azul, Argentina, supported by the World Health Organization and the Argentinian government.

The University of Illinois Center, to be directed by Dean Carl A, Brandly of the College of Veterinary Medicine, will provide facilities for coordinated attacks on diseases and other health problems by teams of scientists.

Gaines Tape Recordings

The Gaines Dog Research Center, New York, which maintains what is probably the largest **Dog Film Library** in the world, will soon augment it with a series of tape recordings and sound films on topics particularly keyed to the interests of professional dog people, it is announced by Harry Miller, director of the Center.

Several of the new series are already in production. In the meantime, Mr. Miller would like to receive from club officers and program chairmen suggestions for subjects and personalities that would appeal to their groups. Write to him at the Gaines Dog Research Center, 250 Park Avenue, New York 17, N. Y.

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In this on the spot memo, Dr. Picket reveals many interesting facets about gorillas in their natural environment. His observations explain many problems encountered in zoo confinement.

Gorilla Life

DEETS PICKET, D.V.M., M.S.
Kansas City, Missouri

Mimbomimbo (150 miles south of Yokodouma)

Hundreds of miles of unexplored territory are on both sides of us. A green wall of jungle with its massive ferns, interlacing vines and towering umbrella trees closes in on our hut until it seems that we can reach out and pluck the leaves. In spite of the seven Africans looking over my shoulder while I type, I like this peaceful and beautiful place.

With the number of gorillas we have glimpsed, and the hundreds of signs which they have left engraved into the earth, as well as the beds and nests, I am beginning to think that rather than the gorilla being rare, it is the hunter of the gorilla who is rare. There are few who care enough about seeing the gorilla in his native jungle to go to the necessary trouble. It is true that the gorilla inhabits only a relatively small, circumscribed area of the earth's surface and only pockets within that area. Many people believe that there are not more than a few hundred gorillas on earth, but there must be several thousand. The reputation for extreme rarity is probably due in part to the fact that the gorilla lives in the most outlying districts of wildest jungle. Their preference is for the thickest of bush, where, many times, you can not see more than two or three yards in any direction. One is more apt to hear than to see them. That has occurred with me a number of times. Then, too, miles of turning, weaving and twisting one's body through vines, brush and ever fallen trees requires more than a few days of physical training. Men with the best of physiques are tired at the end of a few miles of such. Thanks to my friend, Joe Adelman, who, about ten years ago, introduced us to physical training, I do fairly well in the bush.

Another reason for the belief that gorillas are so rare is that there are relatively few in captivity. Not over 10% of those captured have lived to be displayed in zoological gardens. Gorillas, in their remarkable resemblance to man, have a great susceptibility to his infections. They have had no opportunity to build up a racial immunity; so many of the diseases which barely affect man, prove rapidly fatal to gorillas. Another

even more important condition affecting the longevity of gorillas in captivity is their extreme emotionalism. To people, who are not familiar with the gorilla, his expression seems somewhat placid, but underneath that placid exterior, he is a seething, writhing mass of emotions. Many adult gorillas have died in captivity, and on autopsy, no visible organic lesions have been found. The pathologists have been at a loss to explain the deaths. Many times these animals are those who have remained alone. Having no desire to live, they finally die from extreme melancholy.

Need Tender Care

It is for that reason that gorillas need tender, loving care from the very start. They have been harshly jerked out of their normal environment and away from their mother and father. Unlike most captured animals, they can not be tucked away in a box and fed two or three times a day. The diet must be exact and hygiene of the highest type used. Vaccinations against standard childhood diseases are indispensable. The chances are that gorillas will never be overly plentiful in the zoos. I hope that they continue to thrive in their native habitat.

I have heard some people describe the gorilla as hideous and of horrible mien. Some of us may not look so good either, when our faces are contorted with anger. When relaxed with his family, I think that "lovable" is the better adjective to describe his appearance. Somehow or other, they remind me of a wise old Irishman when enjoying his family. Fortunately, the gorillas have some of our more desirable traits, or else they might not be so lovable.

To some of us conceited humans, it may be a disagreeable surprise to hear that the resemblances to the human are so remarkable that most scientists agree that there is little doubt of a relationship of some kind. Some people may object to the idea on religious grounds, but I suppose the good Lord can relate us to anything or anyone He chooses. They have the same normal temperature, the same blood types, and finger prints like our own. The female carries its young for the same length of time, and, with the occasional exception, she has the same twenty-eight day cycle. Gorillas take the same length of time to mature. They occasionally have young as early as ten or eleven years, but so do the Africans. The facial features of gorillas vary as much as do those of humans, and they bear family resemblances. Their personalities vary all the way from the introvert to the extrovert. They live in family groups; and, although the exception is occasionally found, the lowland gorilla of Cameroun is monogamous.

Gorillas are normally very affectionate animals. When one of the children or a mate has been killed, the others will frequently remain in the vicinity for weeks, crying with low, moaning wails.

In discussing the merits of gorillas, it should not be inferred that the gorilla hasn't earned his reputation for ferocity. However, he is an animal who believes in tending strictly to his own business; and, as long as you leave him alone and don't try to interfere with him or his family, he will leave you alone. Of course, what he thinks of as interference may differ somewhat from your own definition. You may be just wandering down a jungle trail, and, if you are moving too silently and come upon him too suddenly, he may think that you are doing it with malice aforethought and give you a little trouble — and just a little trouble from papa gorilla is more than enough! However, even if you should come upon his family in such a manner, if you don't annoy him further, the chances are that he will charge you with a horrifying roar, but will stop short of where you are, beat his chest a few times, and when mama and the babies have moved on, he will then melt away himself. He actually wants no trouble with you — which is a good thing for you! With the prodigious strength of his horrendous shoulders and arms, he can pull your arms from your body as easily as you break the strings on a Christmas package.

A. A. H. A. CONVENTION HIGHLIGHTS

The annual meeting of the American Animal Hospital Association in Boston, April 19-22, attracted a record breaking attendance of 868 registrants. This past year 70 new hospitals were accepted for membership in the association bringing the total of member hospitals to 515 and inspection and acceptance of new qualified hospitals is proceeding at a rapid pace.

While maintenance of high hospital standards is a primary concern of the organization, there has always been a deep sense of responsibility to the entire veterinary profession. Each year the organization has presented for all veterinarians the world's outstanding small animal professional program. Much of the original information presented at these sessions has been unselfishly incorporated in our literature for the benefit of veterinarians throughout the world. Selected articles will appear in future issues of this publication.

Elected officers of the association for this year are Dr. Wayne H. Riser, president, Dr. Lester R. Barto, president-elect, Dr. Robert K. Knowles, vice-president and Dr. Ralph Ruggles, treasurer.

Annual awards went to Donald C. VanRipper, senior student from Kansas State University, for the Moss essay contest, Dr. Jean Holzworth, The Gaines Foundation Award, and Dr. John Hardenberg the Morris Foundation Award.

Selected Abstracts From The A. A. H. A. Meeting

Management of Shock and Sepsis

Although our knowledge of shock and its management has greatly improved in recent years, the patient that does not respond to routine fluid replacement still presents a problem. Recent studies have defined the presence of chronic disease as a factor in such cases and has spotlighted the role of bacterial toxins. Recent studies rather clearly define the importance of certain toxins from normal intestinal flora as a major factor in irreversible shock. Passage of these toxins through the intestinal barrier during early stages of shock suggests the merit of intestinal antisepsis prior to routine surgery envolving shock.

Although fatal shock has been demonstrated in disease free animals it is probably impossible to supply a food source which is free of bacterial toxins.

Jacob Fine, M.D.

Diseases of the Vertebral Column of the Cat

Apparently all mammals have the problem of disk protrusion. Based on studies of cats it appears that disk protrusions do not occur in cats less than six years old and don't become common until 14 or 15 years of age, when they are very common.

If disk protrusions do occur in cats 6 to 15 years of age, chances are good that it will occur in the neck. In cats 14 years of age or older, chances will be about equal that the lesion will be high lumbar or thoracic. All protrusions in the cat are small compared to dogs. This is probably the main reason why the condition is less pathogenic than in dogs.

These lesions can cause paraplegia in the cat but other conditions are much more likely to be the cause of paresis.

Anthony S. King, A.S., Ph.D., B.Sc., M.R.C.V.S.
Bristol, England

Fluothane in Canine Surgery

Dr. W. B. Singleton

The main advantages of Fluothane are the safety and speed with which depth of anesthesia can be adjusted—literally within a few breaths. The absence of any shock syndrome associated with anesthesia and the almost immediate improvement of poor risk patients is important as are the excellent relaxation, rapid recovery, and non-explosive characteristic of drug. A simple device available in this country from Fort Dodge Laboratories was demonstrated for maintaining prolonged anesthesia safely with a minimum of assistance.

W. Brian Singleton, M.R.C.V.S.
London, England

Dr. L. R. Barto

Nursing and Ward Care

The injured dog found after days or hours of exposure is a shock problem. Body temperature is frequently subnormal. After emergency treatment of blood, fluids, stimulants, antibiotics and corticosteroids, nursing care is required.

Body heat needs to be restored. These animals should be placed on a warm blanket and covered. An electric heating pad or hot water bottle should be applied to extremities only in selected cases. In shock, too much heat is contraindicated.

Following the first few hours of nursing therapy, if response is forthcoming, one should give consideration to the location of injury. Delay of exploratory procedures beyond 12 to 24 hours will increase the risk of infection and limit chances of survival.

Frequently dog fight victims will be found in a severe state of shock, unable to move and covered with dirt and filth. Place these animals in a tub of fairly warm water. Debris is washed off and the water changed allowing a brief hot soak at about 100 degrees to restore circulation.

The animal is then dried with towels and wrapped in a light blanket. At this point usual emergency treatments are utilized. Wound repair should be carried out as early as possible during the bacterial lag phase of four to eight hours. Proper sterile draping and debridement are in order. The animal is then placed in the ward with a blanket to conserve heat.

The injured animal that hides due to fright presents a similar problem of management. Some of these cases are able to eventually reach home under their own power and proper nursing is again called for. These patients are blanketed and turned once every two hours to the opposite side. Temperature, pulse and respiration are noted at the same time. Any change of condition is observed and antibiotics administered. It is important that these patients be turned gently and evenly. If the dog is large two people should carry out the procedure. A carefully graduated dose of a tranquilizer often results in a much improved case some hours later. The phenothiazine derivative tranquilizers are said to have a shock sparing action. They help control nausea and vomiting. They also reduce nervousness and excitement.

Cases suffering internal hemorrhage are better under tranquilization or sedation to allow minimum movement. Frequent changes of position due to pain may overstimulate the vestibular apparatus and account for a great deal of distress. The sedated patient does not resist turning. Caution should be exercised in turning to avoid reopening internal organs.

Cases with respiratory, circulatory distress, or coma need massage. Cases showing evidence of malnutrition should receive concentrated foods if able to eat, or force fed liquids when they are able to take them.

Early ambulation is important. After 18 hours an effort is often made to assist the patient to his feet. If ambulation is not possible catheterization is in order, especially following intravenous fluids. If no urine is obtained, one should suspect a bladder rupture.

Professional observation and supervision is essential regardless of the qualifications of attendants. Many accident cases look quite normal 12 to 24 hours later. If they are discharged, it should be with a guarded prognosis, careful observation and limited exercise.

L. R. Barto, D.V.M.
TV Presentation

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Small Animal Clinic

Questions and Answers from the Southern Association Meeting

Is electrical disturbance a problem in obtaining good electrocardiographs?

This is a very common problem with old machines. A 60 cycle alternating current disturbance is frequently picked up. This can generally be reduced by good grounding and moving equipment away from fluorescent light fixtures.

What percentage of cases examined by electrocardiograph yield a diagnosis and what lesions are commonly found?

We look more for conditions in dogs. About 30% of old dogs considered suspicious on physical examination yield positive electrocardiographic evidence.

Is removal of the canine patella a practical procedure?

Dr. Jacques Jenny, University of Pennsylvania, commented that the procedure must be used with discretion. It is particularly indicated in adult dogs with a limited amount of bowing. In younger animals it is generally wise to try less drastic procedures. The leg will get quite crooked in these younger patients.

Please explain the grading system of congenital hip dyplasia in the dog.

Dr. Gerry B. Schnelle explained that this was merely a method for description of observations. It has lead to some confusion as breeders have used minor variations as grounds to dispute the existence of the problem.

Would traction under anesthesia have any merit in management of intervertebral disk protrusion?

A practitioner in the audience reported that he had used the technic once or twice with rather dramatic results, but Doctor Schnelle commented that if traction could be enforced for long periods as in the human patient, it would probably be quite helpful, but traction under anesthesia might actually make the condition worse afterward.

How should intervertebral disk protrusion be treated?

Doctor Schnelle explained that there is a high percentage of spontaneous recovery. One should delay surgery as long as possible. Rest is extremely important. Do not even move them for *x*-ray purposes. Demerol controls pain nicely and aspirin works well. Cortisone therapy might be considered.

Intranasal Intubation in the Cat

Ureteral catheters are used by practitioners for the gastric infusion of liquids through intranasal intubation. The technic

is simple, rapid and easily performed. Tubing or catheters that are too soft and flexible are difficult to pass through the nasal passage. Ureteral catheters are less flexible and can be guided along the floor of the ventral meatus easily. The no. 5 ureteral catheter has an inside diameter that will allow the insertion of a 20 gauge needle. This size catheter may be used with relative ease and very little trauma to the nasal meatus. Polyethylene tubing (Clay Adams size no. PE 190) may be used if a no. 3 size ureteral catheter is inserted in the lumen of the polyethylene tubing during the process of intubation, then removed to administer the liquid. This tubing has the advantage of a larger lumen that will accommodate an 18 gauge size needle with which fluids may be injected using a 20 or 30 cc. syringe. The cat may be restrained by an assistant or through the use of the cat bag. A few drops of a topical anesthetic are placed in the ventral medial aspect of the nares. One-half percent Pontocaine (Winthrop Labs.) can be used allowing 30 or 40 seconds before passing the tube. Cyclaine (Sharp & Dohme), 5%, may be used allowing 30 seconds to one minute before inserting the tube. Surgical lubricant is applied to the catheter tip and the tube is held approximately two inches from the tip. The tip is directed into the ventral medial portion of the nares and the first two inches are inserted rapidly. The first insertion in the nasal passage often produces a sneezing reflex and at this time, the tube should momentarily be released so that the reflex movement will not remove the tube. The catheter may then be passed rapidly into the stomach. Nasal intubation has been applied three times daily for three to seven days without resistance or apparent tissue damage. Slight hemorrhage occasionally accompanies the intubation, but spontaneous cessation of bleeding occurs rapidly.

Animal Nutritional Research Service

An unusual anomaly observed in the practice of Dr. Fred B. Ogilvie, Kansas City, Kansas. This dog was presented with two perfectly formed toenails attached to the external anal orifice. Attachment was largely skin and surgical removal consisted of severing the small tissue connection. Recovery was uneventful.

Practice Tips

Determination of blood glucose may result in misleading low values resulting from decomposition of glucose if the blood is kept in a warm place or when there is delay in performing the test.—

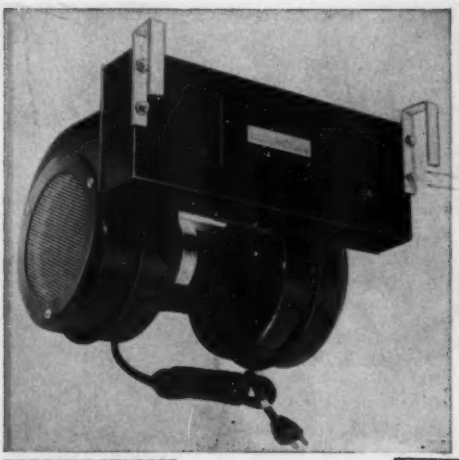
Enlargement of one or more lymph nodes that drain a malignant tumor is not always a positive sign of metastasis. The enlarged nodes may show chronic lymphadenitis rather than tumor spread.

Wright's stain, the most widely used staining procedure for blood smears, shows the following coloration with good staining technic: the red cells are pink, the nuclei of white cells are purplish blue, eosinophilic granules are orange-red, basophilic granules are deep blue-purple, neutrophilic granules are pale reddish violet, and the cytoplasm of leukocytes is varying shades of blue.

Osteoarthritis

Osteoarthritis is characterized by degeneration of the joint surfaces with bony proliferations from the joints. It is usually a disease of old age but can be secondary to coccyfemoral dislocation. Subluxation and a shallow joint will frequently produce an arthritic condition. Malalignment of broken bones can also produce this condition. Lameness and some crepitation on manipulation are the principal signs. The corticosteroids are relied on heavily for beginning treatment. Repeated infusions into the joints may be used. The patients are weaned off to aspirin as soon as possible. Gastric irritation is the biggest disadvantage of salicylates but simultaneous administration of sodium barcarbonate frequently will help. The relief of pain obtained with interarticular injection of corticoids may actually be a handicap. Increased use of the part may cause further damage.

Dr. J. Archibald



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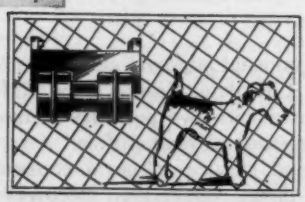

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HORMONAL TREATMENT OF BOVINE CYSTIC OVARIES

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Ovarian cysts with nymphomania are a major cause of infertility in dairy cattle and a source of serious economic losses to the dairy farmer. Our interest in this condition was stimulated because affected cows are usually some of the best producers in the herd. For this reason, the owner usually is willing to try any form of therapy that may salvage an affected cow. We have found that an intramuscular injection of Repositol Progesterone (Pitman-Moore) will correct the hormonal imbalance in the majority of cases, and restore fertility in many of these cows. This is a report of our results since we began to use this treatment in 1956.

Review of Literature

Garm[1] describes nymphomania as a multiglandular syndrome. Its essential symptoms — disorders of the sexual cycle and desire — are related to persistent ovarian follicles, formation of follicular cysts, and absence of corpora lutea. In Garm's view, failure of ovulation and formation of ovarian cysts result primarily from the frequent inability of the anterior pituitary to produce sufficient luteinizing hormone (L.H.) during high lactation. Also, Garm found that the greatest incidence of nymphomania occurred in the earlier (second or third) lactations. He concludes, therefore, that cystic ovaries with nymphomania are a serious economic problem since many cows are sent to slaughter at their best production age.

Several investigators have reported the use of progesterone to control the estrous cycle, and others have reported its use to maintain pregnancy. Christian and Casida[2] found that daily doses of 50 mg. of progesterone, started on the fourteenth day of the estrous cycle, and continued for 14 days, would suppress estrus and prevent ovulation. Ulberg *et al.*[3] reported that subcutaneous injections of 50 mg. of progesterone daily will inhibit estrus and ovulation if the dosage is started before the occurrence of estrus. Trimberger and Hansel[4] found that with daily doses of progesterone ranging from 50 to 100 mg., they could control the interval from one estrus to another and thus shift the time of estrus.

In a study by Dawson[5] of heifers with long histories of infertility, 36 of 47 conceived at first and second services after treatment with 100 mg. of progesterone by implantation. McDonald *et al.*[6] showed that after removal of the corpus luteum in pregnant cows, pregnancy could be maintained by giving daily intramuscular injections of 100 mg. of crystalline progesterone suspended in sesame oil. The

therapy could be discontinued as early as the 162nd day without abortion. They later reported equally good results with Repositol Progesterone in dosages amounting to 50 mg. or less daily when administered as a 500 mg. dose once each ten days.[7] On the other hand, Roberts[8] has found progesterone to be of no value in the treatment of cystic ovaries. His best results were obtained with intravenous injections of chorionic gonadotropin.

Materials and Methods

One hundred cows that had remained in estrus after they had been bred were treated with progesterone. They were of various breeds, but mostly Holstein and Jersey, which are the predominant breeds in the Lansing area. Dosages approximated 1 mg./lb. of body weight and varied from 750 mg. to 1.5 gm. Doses from 10 to 20 cc. (0.5 to 1 gm.) were injected in one site; two sites were used for doses of 30 cc. (1.5 gm.). Injections were made intramuscularly with a 1½ in. 16 gauge needle.

Because even a small amount of water will cause the hormone to precipitate, syringes and needles must be kept dry after sterilization. For this reason, the syringes for Repositol should not be used for any other purpose. One of us has used the same sterilized syringe stored in a Steritube (Becton, Dickinson) but different needles for repeated injections, the other a fresh syringe and needle for each injection, with equally good results. No local irritation has occurred in our experience except in instances when the solution was injected subcutaneously.

Because the Repositol solution is highly saturated and precipitation occurs when it is chilled, the solution must be warmed before use during cold weather.

At the time of treatment, the farmer is told that nymphomaniac symptoms should cease in 36 to 72 hours, and a heat period should follow in three to four weeks, at which time the cow should be bred. If, following this breeding, heat is prolonged, a second treatment is indicated. Many such cows conceive if retreated within ten days (a 3 to 5 day interval is preferable).

Before treatment with progesterone, each cow is examined to determine the presence of ovarian cysts and the condition of the uterus. If there is any evidence of metritis, the cow is also given intrauterine antibacterial therapy since our experience has shown that progesterone causes uterine infection to flare up. The greater susceptibility of the bovine uterus to infection during the luteal phase and resistance to infection under the influence of estrogenic substances were reported by Black *et al.*[9] and Rowson *et al.*[10]

Pregnancy examinations were made at a later date if no further estrus occurred after treatment with progesterone. If further estrus did occur, the cow was rebred, but no more progesterone was given at this time unless excessive estrus recurred.

Results and Discussion

In the majority of the 100 cows in this study excessive estrus ceased within 36 to 72 hours after the progesterone injection. Repeated palpation in these cases revealed normal, gradual ovarian changes, either with the formation of the corpus luteum of pregnancy, or return to the pro-estrual stage with development of graafian follicles and then estrus.

Pregnancy resulted from the pretreatment breeding in 67 of the cows. Some of the 33 that did not conceive during the period of study continued to cycle normally and finally conceived after several breedings. It should be emphasized that all of the cows considered in this study had ovarian cysts with clinical symptoms of nymphomania. Progesterone should not be given for cysts of degenerating corpora lutea.

Normally the uterus is prepared for the implantation and nourishment of the embryo under the influence of progesterone secreted by the corpus luteum. This influence is lacking in the cow with cystic ovaries and nymphomania, and conception is thus prevented. The purpose of progesterone therapy is to stimulate the uterus to undergo the changes necessary for conception. Prolongation of the succeeding estrous period indicates recurrence of the cystic condition and the need for further treatment.

The ability of Repositol Progesterone to promote pregnancy was discovered accidentally when one cow in the group was treated for excessive estrus ten days post-breeding. The cow had been in heat since breeding and was a nuisance in the herd. Rectal palpation of the right ovary revealed a cyst about the size of an orange. Approximately six weeks after the intramuscular administration of 1 gm. of Repositol Progesterone, the owner called and said the cow had never come in heat, as he had been told to expect. Rectal examination at this time revealed that the cow was approximately two months pregnant.

The full significance of the relationship between progesterone and active uterine infection also was not appreciated in the initial stages of this study. Only after two patients developed acute metritis after treatment with progesterone did we realize the importance of a careful initial examination for uterine infection. Although the exact incidence of metritis in this study was not determined, we believe that uterine infection of various degrees was present in 75 to 80% of the cases, and that the importance of a careful examination for metritis at the time of progesterone therapy cannot be overemphasized. For practical purposes, therefore, it seems advisable to give a uterine infusion of a suitable antibacterial agent routinely in all cases.

Progesterone therapy did not inhibit estrus in three cows. All three also failed to respond to injections of either chorionic or anterior pituitary gonadotropin or to anterior pituitary lutenizing hormone, and were sent to slaughter or used as teaser cows or "stooges" at artificial insemination establishments.

We believe that additional research should be conducted to determine the optimum dosage of progesterone for the treatment of nymphomania in cattle, which, perhaps, may be less than 1 mg./lb. of body weight. More knowledge of other aspects of the problem also is needed. For example, bioassays of cystic fluids might provide data that would furnish an explanation for the failure of some cows to respond to hormonal therapy. The possible relationships of uterine motility and metritis to conception also are unknown.

Nevertheless, our results indicate that, in the majority of cases, progesterone in the dosage reported will: (a) abolish symptoms of nymphomania, and (b) assist in preparing the uterine environment for the successful implantation and nourishment of the fertilized ovum.

Summary

Treatment of cows with cystic ovaries is desirable and economically feasible because such cows are usually some of the best producers in the herd. Ninety-seven of 100 cows with ovarian cysts and clinical symptoms of nymphomania were successfully treated with approximately 1 mg./lb. of body weight of Repositol Progesterone intramuscularly. The fact that 67 of the cows became pregnant following treatment indicates that this treatment aids in preparing the uterus for the implantation of the fertilized ovum. Because progesterone greatly increases the susceptibility of the uterus to infection, intrauterine antibacterial infusions also should be given routinely.

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DISEASES OF THE FARROWING SOW AFFECTING BABY PIGS

Part Six

by C. L. VICKERS, D.V.M.
Columbia, South Carolina

Miscellaneous Conditions

Many conditions have been reported by practitioners and others in veterinary journals and drug journals. These conditions are not clearly defined as to cause and are difficult to classify.

One of the conditions is dyspnea which occurs in sows due to farrow. They show in sows due to farrow. They show dyspnea, pulmonary edema, and may sit on their haunches in the same manner as a dog. They may appear normal, and yet fall over dead within a few hours. It is possibly an allergic condition between dam and fetuses or fetal metabolic processes. They recover if the attack is near farrowing time. The treatment is the administration of antihistamines. A similar condition has been described as the puffer sow syndrome.

Another condition, termed milk fever, but not due to hypocalcemia is described. This condition seems to occur during hot weather.

Malignant edema may occur in sows from one to five weeks following farrowing. These sows die quite suddenly. The organism probably gains entrance during farrowing time, or due to wounds or contusions produced by the baby pigs on the sow's udder.

Anorexia, from unknown cause, that may occur in sows following farrowing, has been successfully treated with an injection of corticosteriods and Vitamin B Complex.

There are obviously many more conditions affecting the farrowing sow and directly or indirectly affecting baby pigs which have not been mentioned in this paper.

Allergy to Dam's Milk

Vomiting and scouring characterized by allergy to sow's milk is reported as a disease condition in baby pigs. Supplemental feeding or removing pigs to starter pens is necessary to avoid losses.

Antihistamines for treating sows and pigs have proved of benefit.

Clostridial Enterotoxemia

Cause. Cl. welchii, type C, is the cause of this disease problem.

Age Incidence. Pigs 36 hours to 14 days of age are susceptible.

Signs of Infection. Sudden death in some before sickness is observed is characteristic. Some blood tinged diarrhea may be evident, but this is not a consistent finding. In one outbreak reported from Hungary, 70% of newborn pigs died. Death occurred at 3-6 days with a few dying after 2 weeks of age.

Congested small intestines are evident at necropsy. In the outbreak in Hungary the intestinal wall was emphysematous and congested with necrotic lesions in the jejunal mucosa.

Treatment. Lamb dysentery (*Cl. perfringens* type B 2 cc.) protected a test litter in experiments.

Edema Disease (Enterotoxemia — Gut Edema)

Cause. The cause has not been definitely established. There is strong evidence to suggest the condition is due to a toxin or toxins associated with a hemolytic coliform organism.

Predisposing Causes. Sudden changes in environment, changes in feeding practices, and in general, changes in management procedures. The disease has often been noted following deworming, vaccinating and castrating.

Age Incidence. Inclusion of this disease in a discussion of baby pig diseases may be questioned since it affects swine of all ages and more often occurs in pigs from weaning age to about 16 weeks. However, it does occur in suckling pigs and a brief discussion of the disease seems in order.

Clinical Signs. The signs are variable. At first there may be only listlessness and some loss of appetite. At times the onset is sudden and the first indication of the disease is the finding of a dead pig. It affects pigs in the best of condition. Signs that are noted include dyspnea, edema of the eyelids and mandibular region, redness of the ears and nose, and a weak, wobbly, incoordinated gait. Handling the pigs may cause only a hoarse grunt instead of the usually high pitched squeal. Fine muscular tremors sometimes occur. In the terminal stages they often walk aimlessly or even circle, and the incoordinated gait progresses to gradual paralysis. Convulsions occur and pigs that are down often make paddling motions with their legs. Diarrhea or constipation may occur, but more often they are constipated. The temperature is usually normal but some individuals run temperatures as high as 105 F. The course of the disease varies from two to 14 days with five to seven days being the usual course. Recoveries are rare in those animals that go down. The morbidity is from 4 to 40% and the mortality may run as high as 90%.

Necropsy reveals an excess of fluid in the pericardial, peritoneal and pleural cavities. This fluid gels upon exposure to air. Edema and hemorrhage may occur in the same individual, but more often only one or the other of these conditions is noted. The edema can be extensive or restricted to a very small area. The edema is a jelly-like, glistening mass and is found in any or all of the following locations: in the stomach wall along its greater curvature; in the mesenteric folds of the coiled portions of the large intestines; in the eyelids, ears, subcutaneous areas of the face and jowls; in the ventral area of the abdominal wall; in the tissues surrounding the kidneys, underneath the capsule of the kidney and around the rectum; in the wall of the gall bladder; on the surface of the heart; and in any or all of the lymph nodes. Hemorrhages, when they occur, vary from petechiae, to ecchymotic, to diffuse. They may be found on the heart, kidneys, lungs, larynx, trachea, stomach or intestines. In the stomach and intestines they occur on the serosal or mucosal surfaces. The term "mulberry heart" has been used to describe a diffuse hemorrhage on the heart, but this lesion is rarely seen. "Flea bite" lesions of the skin have been described due to cutaneous hemorrhage.

Diagnosis. A diagnosis may be reasonably established on the basis of a history of sudden deaths in pigs in good condition, along with typical clinical and necropsy findings. Specimens should be submitted to a diagnostic laboratory for confirmation of findings. The edema disappears within a few hours after death.

Prevention and Treatment. At present no immunizing agent is available. Those stress factors thought to precipitate the condition should be avoided whenever possible. A number of treatments have been suggested, but none have proved entirely satisfactory. The most consistently recommended treatment is a saline cathartic, epsom salts, in the feed or water. It is also generally recommended to withhold or reduce the feed and water for several days. Other treatments that have been tried with varying degrees of success include: (1) injection

of antihistamines; (2) injection of stimulants; (3) injection of corticosteroids; (4) injection of 5% sulfamethazine and 5% sulfamerazine solution intraperitoneally at the rate of 0.5 cc. per pound of body weight prophylactically and 1 cc. per pound of body weight therapeutically; (5) injection of a vitamin B complex solution; (6) oral use of a detoxifying tablet containing sodium thiosulfate, dextrose, sodium nitrite and methylene blue; (7) adding 1 to 4% charcoal in the feed if pigs have a diarrhea; and recently a treatment that has been suggested as beneficial is (8) Vetamox acetasolamide sodium orally in the feed or drinking water or parenterally at the rate of 2 to 5 mg. per pound of body weight.

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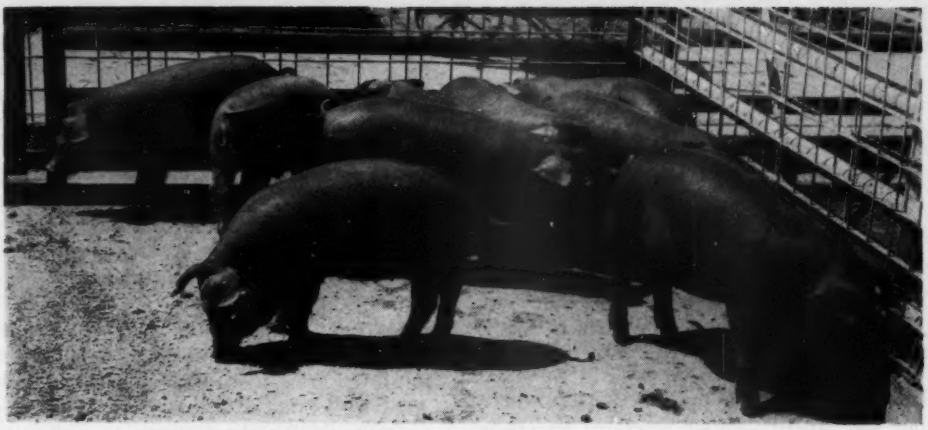

EFFECT OF HYGROMYCIN B ON NEMATODES

MAX C. McCOWEN, M.S., FRANK O. GOSSETT, D.V.M.
MAURICE E. CALLENDER, M.S., MILO C. BRANDT, M.S.
The Lilly Research Laboratories
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EARLIER EXPERIMENTS[1,2] revealed that concentrations of 10, 20, 40, or 80 million units of hygromycin B[3] per ton of complete feed were effective in the control of certain nematodes of swine. On the basis of those tests, it was postulated that 12 million units (6,000 u/lb) of hygromycin B in Hygromix (*Streptomyces hygroscopicus* fermentation products, Lilly) added to a ton of complete feed should give a satisfactory anthelmintic effect.

Part I of this report describes an experiment which was designed to determine the anthelmintic efficacy of a complete ration containing 12 million units of hygromycin B fed to pigs at a beginning average weight of 26 lb. for a period of 42 days.

Part II is concerned with the feeding of rations containing Hygromix to gilts of breeding age. Since brood sows and gilts can be a source of contamination to their litters, the objective was to determine the value of hygromycin B for the control of intestinal parasites in breeding swine prior to mating. In this test two methods of feeding open gilts were used. One method consisted of feeding hygromycin B in a complete ration. In the other method hygromycin B was mixed in the protein supplement. Limited quantities of each ration were hand fed daily.

Part I

This experiment was designed to determine the anthelmintic action of a regular production lot of Hygromix containing 24 million units of hygromycin B per pound when fed to pigs for six weeks at a concentration of five pounds (12 million units of hygromycin B) per ton of complete ration.

Materials and Methods

Eighteen pigs weighing an average of 26 lb. were purchased from a local farmer. They were allotted into two similar groups on the basis of their body weights and housed on steam cleaned concrete floors. One fecal flotation worm egg count on each pig was made prior to the feeding of hygromix and one at weekly intervals during the test. The egg counting technic was the same as that used in earlier experiments. The feces was collected from each pen daily and screened for *Ascaris lumbricoides*.

The control group received a complete swine ration containing 14% protein, whereas the treated group received the same ration plus 12 million units of hygromycin B (in Hygromix) per ton of complete feed. The ration was weighed and recorded as it was fed. The pigs were weighed at two week intervals and at the end of the test. Feeding of hygromycin B was discontinued at six weeks and the control ration was substituted for one week. At this time the pigs were slaughtered and nematodes in the digestive tracts were counted.

Results and Discussion

The results of weekly fecal flotation tests and the ascaris recovered from the feces, as well as total worms recovered at slaughter, are indicated in table 1.

Average egg counts on day 0 indicate a uniform distribution of parasites in the control and treated groups. Decrease in egg counts suggests a difference in the sensitivity of these three parasites to the treatment. An early drop in strongyle eggs followed by a drop in *A. lumbricoides* (roundworms) eggs after 20 days treatment, and the disappearance of *Trichuris suis* (whipworm) eggs after the 34th day, may reflect their relative sensitivity. The difference in the number of worms recovered at slaughter also indicates that *Oesophagostomum* spp. (nodular worms) and *A. lumbricoides* are more sensitive to the drug than is *T. suis;* however, all three species are inhibited by the drug. Weight gains and feed conversions of the Hygromix treated pigs were improved over those of the control group. Analysis of data reveals these differences are not statistically significant.

Part II

Since it is not the general field practice to self feed brood sows and gilts, this experiment was designed to determine the value of hygromycin B as an anthelmintic for gilts when the feed intake is limited.

TABLE 2. Pigs—The Effect of Hygromycin B on Feed Consumption, Weight Gain, and Feed Conversions of Weaned Pigs

Treatment	Control	Hygromycin B
Number of animals	9	9
Days fed	42	42
Avg. initial weight, lb.	25.7	25.7
Avg. final weight, lb.	61.0	68.8
Gain per animal, lb.	35.3	43.1
Avg. daily gain, lb.	0.84	1.03
Avg. daily feed, lb.	2.63	3.07
Feed required per lb. gain, lb.	3.13	2.98

TABLE 1. Pigs—The Effect of Hygromycin B on Egg Counts and the Number of Worms Recovered from Fecal Material and Intestinal Tracts at Time of Slaughter

Days	0	3	13	20	27	34	41	48	Worms From Feces	Recovered From Intestine
Nodular worms										
Controls	200	175	350	500	300	80	415	250	*	78
Hygromycin B	265	50	50	0	0	0	0	0		0
Whipworms										
Controls	150	190	65	500	110	200	295	235	*	142
Hygromycin B	215	125	300	365	210	165	0	0		21
Ascaris										
Controls	2050	4300	10,300	9850	14,200	4400	6000	4150	16	83
Hygromycin B	950	3800	2,300	2450	450	250	50	50	27	0

*Feces was not screened for nodular worms or whipworms.

Materials and Methods

Sixty-four gilts were purchased from a local farmer. They were selected from a larger group at the time of marketing (approximately five to six months of age). Two fecal specimens from each gilt were checked for the type and number of parasite eggs present by the technic described in an earlier report.[2] The gilts were allotted into 16 similar pens (four pigs each) on the basis of these egg counts. The 16 pens were assigned to two groups of eight and given hygromycin B, carried in a 35% protein supplement, as indicated in tables 3 and 4. The eight pens in one group were fed shelled corn and supplement separately (free choice). In the second group the corn and supplement were ground together and fed as a complete feed. All animals were weighed and their feed consumption was calculated on day 50. The treatment of the animals on complete feed was discontinued on day 49, but the animals that received supplement free choice were continued on treatment for 56 days. All animals were slaughtered at the termination of the experiment. The intestinal tracts and contents were examined and the worms were counted. Because of the time required in picking and counting the worms, those animals that contained more than 125 worms were recorded as having greater than 125 (∨125) worms and a complete count was not made. In calculating the total worms recovered on graph 1 and 2, the figure 125 was used.

Results and Discussion

The animals obtained for this test were heavily infested with nodular worms; however, very few large roundworms or whipworms were present. For this reason only data concerning nodular worms are included.

Graph No. 1

Weekly average strongyle egg counts and nodular worms found at slaughter from gilts that received hygromycin B supplement and shelled corn.

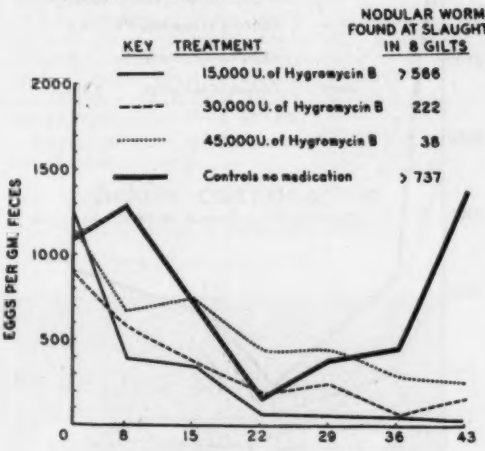
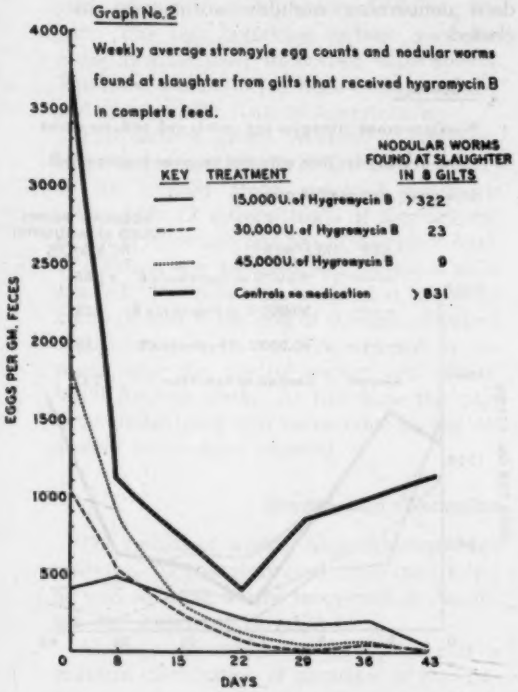


TABLE 3. Gilts—The Effect of Hygromycin B (In Free Choice Supplement) on Weight Gains, Feed Consumption, and Feed Conversions of Breeding Age Gilts

Treatments*	30,000 u/lb. of Supplement Rep. 1	30,000 u/lb. of Supplement Rep. 2	60,000 u/lb. of Supplement Rep. 1	60,000 u/lb. of Supplement Rep. 2	90,000 u/lb. of Supplement Rep. 1	90,000 u/lb. of Supplement Rep. 2	None Controls Rep. 1	None Controls Rep. 2
Number of animals per pen	4	4	4	4	4	4	4	4
Days fed	50	50	50	50	50	50	50	50
Avg. initial weight, lb.	233	218	199	216	218	214	209	229
Avg. final weight, lb.	266	252	236	242	256	246	246	249
Gain per animal, lb.	33.3	34.0	37.5	26.0	37.3	31.5	37.0	19.8
Avg. daily gain, lb.	0.67	0.68	0.75	0.52	0.75	0.63	0.74	0.40
Supplement, lb.	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Grain, lb.	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Avg. daily feed, lb., total	5	5	5	5	5	5	5	5
Feed required per lb. gain, lb.	7.46	7.35	6.67	9.61	6.67	7.93	6.76	12.50
Estimated** Average daily consumption of hygromycin B per pig	15,000 units	15,000 units	30,000 units	30,000 units	45,000 units	45,000 units	0	0

*Hygromycin B — reported as million units per ton of supplement.
**Assuming each pig consumed 25% of total supplement issued to pen.

Graph 1 contains the average strongyle egg counts and nodular worms found at slaughter from gilts that received hygromycin B in supplement. Graph 2 contains the average strongyle egg counts and nodular worms found at slaughter from gilts that received hygromycin B in the complete feed. Table 3 contains weight gains, feed consumption, and feed conversion data of gilts on grain and supplement. Table 4 contains weight gains, feed consumption, and feed conversion data on the gilts that received the complete ration.



Hygromycin B in Hygromix was more effective when incorporated in a complete feed than in a supplement. The gilts on complete feed gained more weight than those on supplement and shelled corn. A complete feed not only assured the consumption of the proper nutrients in a desirable ration, but provided for more uniform consumption of Hygromix.

Summary

1. In part I of this experiment, Hygromix containing 6,000 units of hygromycin B per pound of complete feed was very effective against Oesophagostomum spp. (nodular worms) and *Trichuris suis* (whipworms) when fed *ad libitum* to weanling pigs for a period of 42 days. The pigs consumed the feed readily and gained well during the experiment.

2. In part II, concentrations of 30,000 and 45,000 units of hygromycin B (as Hygromix) per gilt in five pounds of complete feed were very effective in the removal of nodular worms from breeding age gilts.

3. In part II, 30,000 units of hygromycin

TABLE 4. Gilts—The Effect of Hygromycin B on Weight Gains, Feed Consumption, and Feed Conversions of Breeding Age Gilts (Complete Feed)

Treatment*	3,000 u/lb. of feed		6,000 u/lb. of feed		9,000 u/lb. of feed		None Controls	
	Rep. 1	Rep. 2	Rep. 1	Rep. 2	Rep. 1	Rep. 2	Rep. 1	Rep. 2
Number of animals per pen	4	4	4	4	4	4	4	4
Days fed	50	50	50	50	50	50	50	50
Avg. initial weight, lb.	206	219	208	194	216	208	215	230
Avg. final weight, lb.	238	250	254	229	253	238	251	270
Gain per animal, lb.	32.0	30.8	45.8	35.0	37.5	30.0	35.8	40.8
Avg. daily gain, lb.	0.64	0.62	0.92	0.70	0.75	0.60	0.72	0.82
Avg. daily feed, lb.	5	5	5	5	5	5	5	5
Feed required per lb. gain, lb.	7.81	8.13	5.46	7.14	6.67	8.33	6.99	6.1
Estimated**								
Average daily consumption of hygromycin B per pig	15,000 units	15,000 units	30,000 units	30,000 units	45,000 units	45,000 units	0	0

*Units of hygromycin B as Hygromix.
**Assuming each pig consumed 25% of total feed issued to pen.

B (as Hygromix) per ½ lb. of protein supplement fed free choice (not mixed with grain) was less effective as an anthelmintic than the same amount mixed in the complete feed; however, 45,000 units of hygromycin B daily in ½ pound of supplement was effective as an anthelmintic.

Acknowledgments

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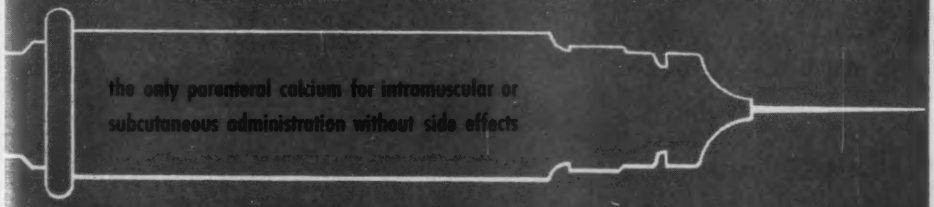

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Dr. James F. Alberson, Colo. '51. has recently been appointed to represent "Prescription Diets" in the Southwestern area. Dr. Alberson's previous experience includes several years in small and large animal practices and regulatory work in the State of Oklahoma.

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Mr. I. Willard Crull has been elected to the Board of Directors of Allied Laboratories, Inc.

Mr. Crull is president of Campana Corporation, a subsidiary of Allied Laboratories, Inc., which is also the parent firm of Pitman-Moore Company of Indianapolis.

Dr. S. R. Bozeman, Pitman-Moore Company vice president and director of the firm's biological laboratories, has been named to the Board of Directors of Allied Laboratories (Canada) Ltd.

Dr. Bozeman's election was announced by J. L. McKee, president of Allied Laboratories, Inc., parent firm of both Pitman-Moore Company and Allied Laboratories (Canada) Ltd.

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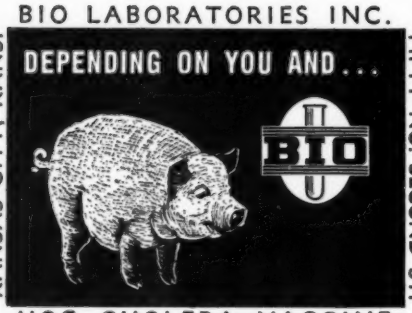

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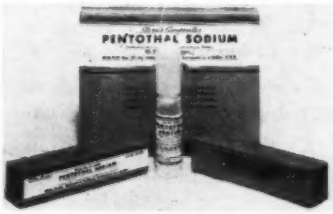

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Dr. J. F. Smithcors, Associate Professor of Anatomy in the MSU College of Veterinary Medicine, has been elected to the Council of the American Association for the History of Medicine. His election took place at a recent meeting of the association at Charleston, S. C. The AAHM is composed of persons engaged in teaching and research in the history of medicine and allied sciences. Dr. Smithcors, a leading authority on the history of veterinary medicine, was the first veterinarian to become a member of this group, and is president of the American Veterinary Historical Society. He has had more than 70 articles on historical subjects published in the medical history and veterinary journals of the United States and England, and is a contributor to the Encyclopedia Britannica. The author of a book, "Evolution of the Veterinary Art," he is currently completing a comprehensive history of veterinary medicine in America under sponsorship of the American Veterinary Medical Association.

The College of Veterinary Medicine at Michigan State University was the first in the United States to include in its curriculum a course in the history of veterinary medicine. The Veterinary Historical Collection, which has received generous support of alumni through the MSU Development Fund, is recognized as the finest collection of old and rare veterinary books in this country.

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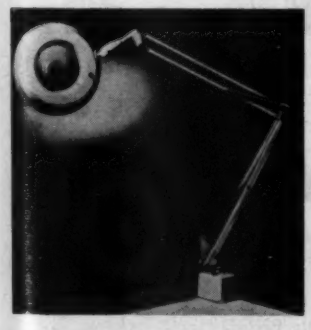
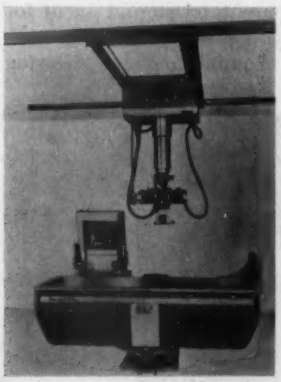
Reader's Service

A new **magnifying lamp** designed for close inspection work combines a 5″ diameter magnifying glass with a shadow-free 22 watt fluorescent light. For additional versatility, the "Inspector" features a built-in dual electric outlet mounted on the base (This exclusive feature is optional extra). A custom-engineered arm with a 45″ reach gives



360° on-the-spot positioning, and special adjustment knobs insure proper tension and steadiness in any position desired. The "Inspector" is available in several styles of base mounts, and in a choice of colors. For complete information and prices for the "Inspector" and other lamps for professional uses, write to Swing-O-Lite, 13 Moonachie Road, Hackensack, N. J.

X-ray apparatus, cobalt teletherapy, and fluoroscopic machines can now be leased for terms of three years or longer. The lease

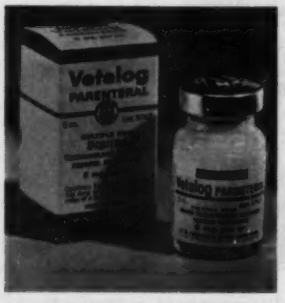


plan applies to all equipment manufactured and distributed by Standard X-Ray Company, Chicago, and is being underwritten by Nationwide Leasing Company, Chicago. Equipment can be leased by doctors, dentists, medical groups, clinics, hospitals, schools, and other individuals and groups having use for the apparatus. Further information on the lease plan may be obtained by writing to Standard X-Ray Co., 1932 North Burling St., Chicago 14, or to Nationwide Leasing Company, 11 South LaSalle St., Chicago 3.

New tool for **catching and holding livestock** is being marketed to veterinarians. The "Speed-E-Catch" long-handled holder

has tongs that catch snout of swine or nostrils of cattle — holds the animal still while you treat it. Can also be used for dogs and cats. For details write Dick's Sales Company, Box 6021-C, Kansas City, Mo.

Vetalog, a new parenteral steroid agent for use in veterinary medicine, is being marketed by E. R. Squibb & Sons. Vetalog



(Squibb triamcinolone acetonide aqueous suspension) is a highly potent corticosteroid which controls symptoms in animals in various dermatoses, arthritides and related disorders. It also induces rapid and prolonged relief in inflammatory and pruritic dermatoses of animals. Vetalog's anti-inflammatory activity is 40 times greater than hydrocortisone acetate and 10 times that of prednisolone. Squibb supplies Vetalog as a sterile aqueous suspension, five cc. vials,

(continued on page 110)

YOU'LL DO BETTER WITH Oster® THE VETERINARIAN'S CLIPPER

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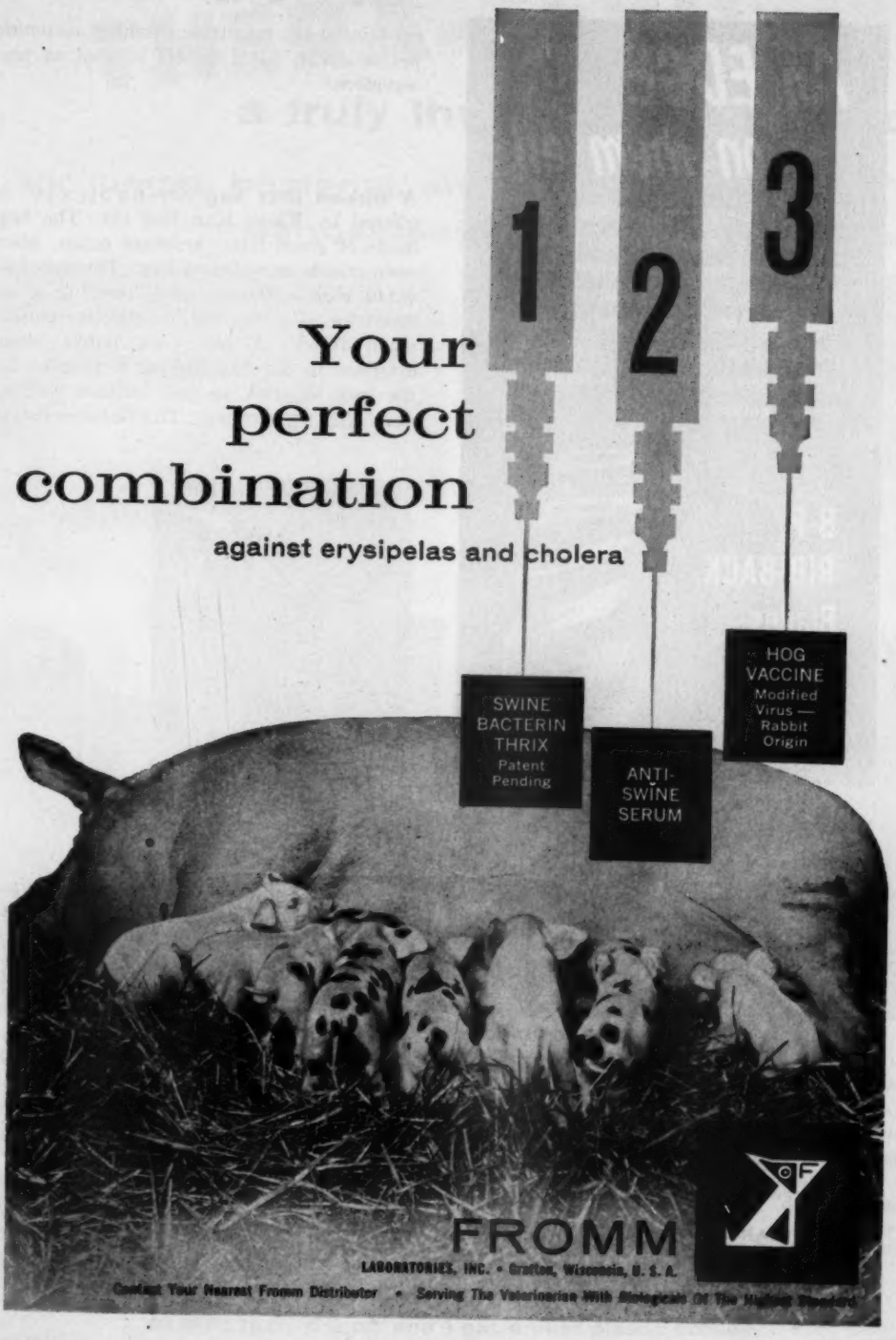

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(continued from page 108)

containing six mg. triamcinolone acetonide per cc., with 0.9% benzyl alcohol as preservative.

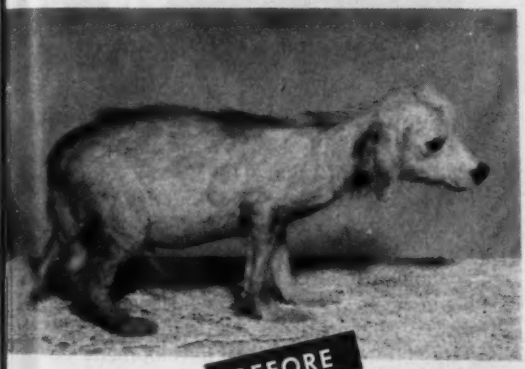
A stick-on litter bag size 6 x 3½ x 11" is offered by Klean Kan Bag Co. The bag, made of green flame resistant paper, when open stands as a square box. Through patented tuck-in flaps a wide opening is assured for easy use and for effective closing when filled. A self stick patch comes attached to the bag making it possible for the bag to stick to any surface without damaging or marking. The flame resistant

paper makes the bag safe even when cigarette ashes are flicked into it. Ideal for hospital and convalescent homes, this bag sticks to patient's bed or table eliminating damaging pinning to bedding yet close at hand for all waste. As a free standing box like receptacle it replaces waste baskets which require clean-up. Infectious waste may be sealed in when discarding the bag by folding the gummed flap forward and sealing it to the face of the bag. Pleasing in color, sticking easily and tenaciously to all surfaces without damage, this disposable bag is planned for keeping litter-free the family car, the office, the factory, the shop the lab and the hospital room. Samples and prices are available from the Klean Kan Bag Co., 64 E. 8 St., N. Y. 3.

NOW! THERA-TERGENT

a truly therapeutic shampoo

for fungal, bacterial, and allergic dermatoses of dogs, cats, horses



BEFORE

AFTER

THERA-TERGENT is a new, effective and clinically proven[1] dermatologic shampoo. Its drug elements are synthesized to achieve uniquely deep dermal penetration — destroy bacteria and fungi, ***both*** on and within the skin. Its concentrated* shampoo base, of unusual detergent action, cleanses hair and skin thoroughly, at the same time helps replace lost skin oils — soothes the integument, allays pruritus, promotes healing.

And safe! THERA-TERGENT may be used without special protection of eyes or genitalia of the animal — is completely safe for use on cats. It is nonstaining, leaves the animal pleasantly scented. It will not irritate skin, eyes, nose, or respiratory tract of the user. Contains 6% Triethanolamine Thiocyanate Warren-Teed.

1. "Clinical Evaluation of a Drug for Dermatoses of Dogs and Cats," Wenger, J. B., Vet. Med., 55:55-58, Mar. 1960.

* Treats more animals per bottle.

SUPPLIED: 5¾ oz. and 1 gal. amber plastic bottles

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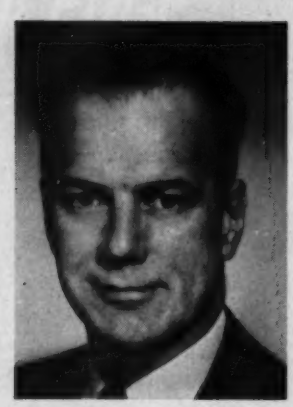
WARREN-TEED PHARMACEUTICALS

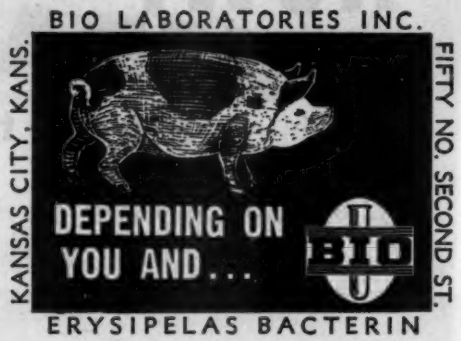
Dr. Britton Appointed Vice President



Dr. Allan Q. Britton (OSU '42) has been appointed a vice president of the Fort Dodge Laboratories Division of American Home Products Corporation, Fort Dodge, Iowa.

Dr. Britton joined the company in 1949 as assistant superintendent of the biological farm.

Dr. John Ravnikar (KSU '57) and Dr. John R. Eppley (OSU '58) have joined the Fort Dodge Laboratories professional staff. Dr. Ravnikar is assistant to the director of the biological laboratories and Dr. Eppley diagnostician. Dr. Harlen Engelbrecht, formerly diagnostician, has joined the staff of the biological product development department.



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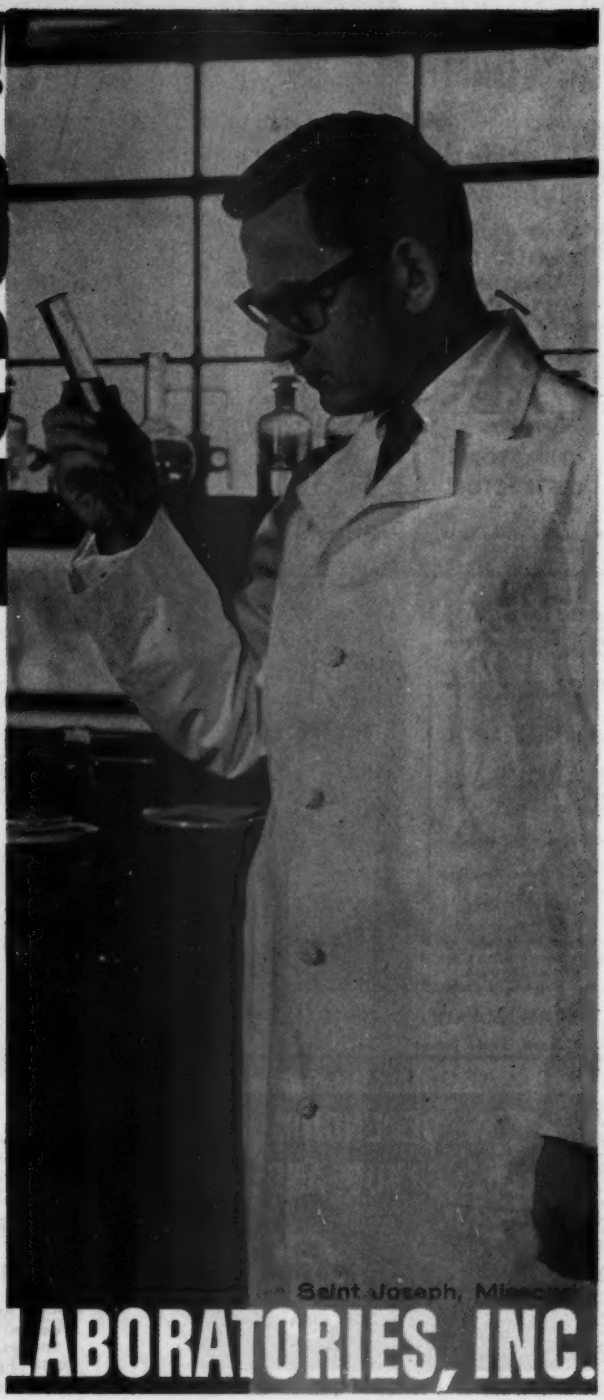

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Veterinary Calendar

Jun. 13-15. **Florida Board of Veterinary Examiners,** examination for state license. Biscayne Terrace Hotel, Miami, Florida. Applications must be in by June 1st. E. F. Thomas, secretary.

Jun. 14-16. **Michigan State Veterinary Medical Association,** annual meeting. Pontlind Hotel, Grand Rapids, Michigan. Dr. John J. Godisak, publicity chairman.

Jun. 20. **West Virginia Veterinary Board,** examinations for state license. Capitol Bldg., Room E-116 Ground Floor, East Wing, Charleston, West Virginia. Dr. Henry J. Fallon, secretary-treasurer, 200 Fifth Street West, Huntington, West Virginia.

Jun. 20-21. **Michigan State Board of Veterinary Examiners,** examination for state license at Lansing, Michigan. Corresponding Secretary, 641 Lewis Cass Bldg., Lansing 13, Michigan.

Jun. 20-21. **North Carolina Veterinary Medical Association.** Fifty-ninth annual summer meeting. Grove Park Inn, Asheville, North Carolina. J. T. Dixon, 3026 South Main Street, Winston-Salem, North Carolina, secretary-treasurer.

Jun. 20-22. **North Carolina State Veterinary Examining Board,** examinations for a license in North Carolina. Grove Park Inn, Asheville, North Carolina. Dr. James I. Cornwell, P. O. Box 9038, Asheville, secretary-treasurer.

Jun. 22-24. **Massachusetts Board of Registration,** examination for registration, University of Massachusetts, Amherst. Dr. Edward A. Zullo, Secretary, Board of Registration in Veterinary Medicine, Room 33, State House, Boston 33, Massachusetts.

Jun. 23-24. **Maryland State Veterinary Medical Association,** summer meeting. George Washington Hotel, Ocean City, Maryland. Dr. Harry L. Schultz, Jr., secretary.

Jun. 27-29. **California Veterinary Medical Association,** 72nd annual convention. Jack Tar Hotel, San Francisco, Calif.

July 12-13. **Iowa State University,** annual conference. Memorial Union, Ames, Iowa.

July 18-19. **Kentucky Veterinary Medical Association,** 49th annual convention. Sheraton-Seelbach Hotel, Louisville, Kentucky. L. S. Shirrell, DVM, secretary.

July 20-22. **Swine Repopulation Conference.** Extension Service, College of Agriculture, University of Nebraska, Lincoln, Nebraska. Crosby Howe, DVM.

July 24-27. **Canadian Veterinary Medical Association,** annual convention. Halifax, Nova Scotia. Dr. M. D. Harlow, Box 1153, Halifax, Nova Scotia.

Aug. 1-2. **Arkansas Veterinary Practitioners' Association,** annual meeting. Holiday Inn, Hot Springs, Arkansas. Wayne H. Babbitt, DVM, 204 East 13th Street, North Little Rock, Arkansas, secretary-treasurer.